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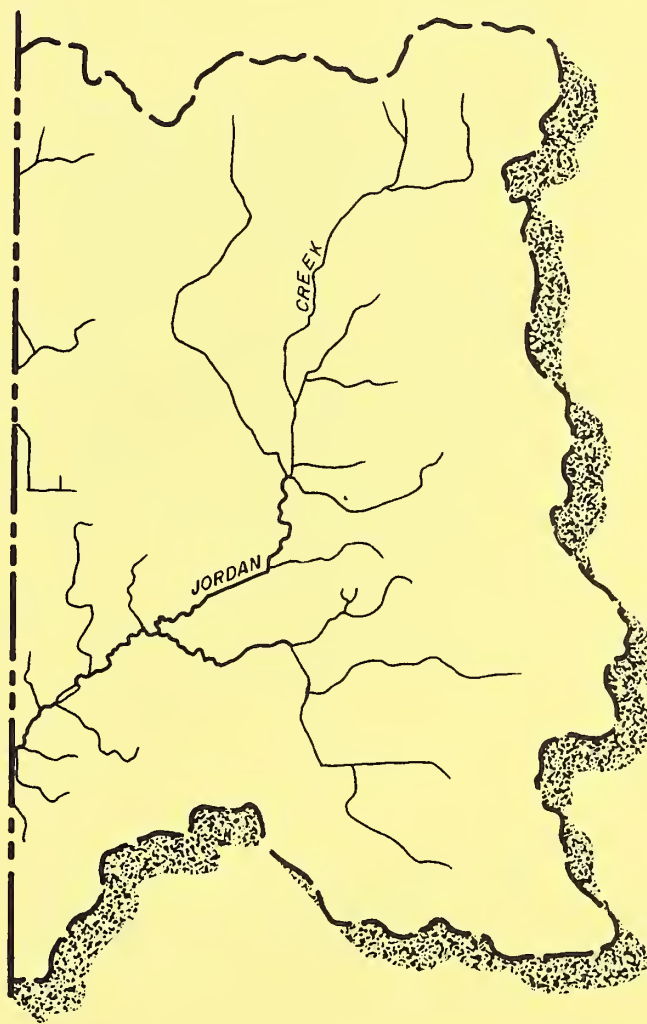
ENVIRONMENTAL IMPACT STATEMENT

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For

JORDAN CREEK WATERSHED

WARREN COUNTY, INDIANA



OCT 1975



A LOCALLY INITIATED PROJECT
WITH FEDERAL ASSISTANCE THROUGH P.L. 566
83rd Congress, 68 Stat. 666 as amended
U.S. Department of Agriculture
Soil Conservation Service

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JORDAN CREEK WATERSHED

Warren County, Indiana

FINAL ENVIRONMENTAL IMPACT STATEMENT

Cletus J. Gillman, State Conservationist

Soil Conservation Service

Sponsoring Local Organizations:

Jordan Creek Conservancy District
Box 6, Pence, Indiana 47973

Warren County Soil & Water Conservation District
R. 3, Williamsport, Indiana 47993

Prepared By:

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Indianapolis, Indiana 46224

October 1975

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USDA ENVIRONMENTAL IMPACT STATEMENT

Jordan Creek Watershed Project

Warren County, Indiana

Prepared in accordance with
Sec. 102 (2) (C) of PL 91-190

II. Summary Sheet 1/

- A. Final
- B. Soil Conservation Service
- C. Administrative
- D. Description of action: A project for watershed protection, flood prevention, and drainage in Warren County, Indiana to be implemented under authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83d Congress, 68 Stat. 666), as amended.

Project structural measures consist of approximately 28.4 miles of channel work on man-made ditch or previously modified channel, 46.7 miles of surface drains, 5.1 miles of grassed waterways, 19.8 miles of tile and 50 grade stabilization structures. The flow in the reaches with channel work is classified as 3.4 miles perennial, 10.3 miles intermittent, and 14.7 miles ephemeral.

- E. Summary of environmental impacts: Adequately treat nearly 27,500 acres (78 percent of the watershed). Reduce soil loss on 8,400 acres and improve channel bank stability thus reducing erosion and sedimentation. Provide joint flooding and drainage relief on approximately 15,920 acres and overbank flooding relief on 1,390 acres. Improve wildlife habitat by vegetative land treatment measures. Afford management to 15 acres of forest land. Protect woody habitat and idle land within the permanent easement on the unconstructed side. Plant 27 acres of trees and shrubs and 56 acres of grasses and legumes on the spoil bank. Improve the quality of life and increase demands on area business.

Destroy 22 acres of woody habitat as a result of channel work. Damage unconstructed side of channel during installation of grassed waterways, surface field ditches and grade stabilization structures. Increase noise, air and water pollution (turbidity) during construction.

1/ All information and data, except when otherwise noted by reference to source, were collected during watershed planning activities by the Soil Conservation Service, and Forest Service, U.S. Department of Agriculture.

II. SUMMARY SHEET - CONT'D

- F. List of alternatives considered: 1) installation of subsurface drainage pump system and 2) no PL-566 project--no local action.
- G. Agencies from which written comments were received for the draft statement:
- Department of Health Education and Welfare
 - Department of the Interior
 - Department of Transportation
 - Environmental Protection Agency
 - Advisory Council of Historic Preservation
 - Indiana Department of Natural Resources (For Governor)
 - Indiana State Clearinghouse
 - Ohio River Basin Commission
 - Indiana State Historic Preservation Officer
- H. The draft statement was transmitted to CEQ on March 14, 1975.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

USDA SOIL CONSERVATION SERVICE
ENVIRONMENTAL IMPACT STATEMENT
for

Jordan Creek Watershed, Warren County, Indiana

- A. Authority: Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83d Congress, 68 Stat. 666, as amended.
- B. Sponsoring local organizations: Warren County Soil and Water Conservation District and Jordan Creek Conservancy District.
- C. Project purposes:

1. Watershed protection (conservation land treatment)

The soil and water conservation district will encourage landowners to install good vegetative treatment and improve farming methods for erosion control and water management. Their goal is to have at least 27,500 acres (78 percent) of the total watershed adequately treated by the end of the project installation period.

2. Flood prevention

The objective of landowners along major channels is to reduce the flooding to acceptable levels consistent with present cropland.

The acres being flooded at present are:

<u>Frequency</u>	<u>1 year</u>	<u>5 years</u>	<u>10 years</u>	<u>50 years</u>
Reach A	92	242	296	409
Reach B	70	153	169	218
Reach C	117	195	243	342
Reach D	85	277	336	467
Reach E	150	202	224	266

3. Drainage

Another goal of the sponsors is to provide safe and timely removal of excess water from flood plain and depressional areas. Subsurface water removal for all areas in need is also desirable as a part of the project works of improvement. Removal of excess water within a 24-hour period is the general goal of the sponsors. Areas affected by reach are: A--2,107 acres; B--4,521 acres; C--1,709 acres; D--4,715 acres; E--2,368 acres; and J--504 acres.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

D. Planned Project

1. Land treatment measures

An accelerated land treatment program will be installed on the watershed.

The land treatment measures to be installed during the 8-year project installation period include conservation practices on 27,347 acres of cropland, 150 acres of pasture, 15 acres of forest land, and 5 acres of other land. Adequate treatment will be achieved on 27,517 acres covering 78 percent of the total watershed at the end of the installation period. This acreage is in addition to the 7,345 acres presently treated.

Conservation practices to be applied on cropland include contour farming, terraces, diversions, grassed waterways or outlets, minimum tillage, crop residue use, grade stabilization structures, subsurface drains, and drainage mains or laterals.^{1/} A combination of two or more practices are often needed to achieve adequate treatment of land. Land treatment practices such as waterways, diversions, pasture planting and management, and tree planting will benefit wildlife. The Soil Conservation Service Technical Guide will be used in planning alternatives for adequate land treatment.

Pasture land treatment measures to be installed include pasture and hayland planting and pasture and hayland management.

Forest land treatment measures to be installed are tree planting on open lands where necessary to control erosion and adjusting land use to land capability throughout the watershed. Adapted species for planting will be recommended by the Indiana Department of Natural Resources (IDNR) in cooperation with the U.S. Forest Service. Hydrologic conditions will be improved by manipulation of stand composition, protection from grazing and implementing management plans. The multiple-use forest land treatment program was cooperatively developed by IDNR, Division of Forestry and the U.S. Forest Service.

There are 123 landowners and operators of the 184 farms (67 percent) that are now voluntary cooperators and have signed agreements with the Warren County Soil and Water Conservation District (S&WCD). The District plans to continue emphasis on getting voluntary cooperative agreements signed by all landowners and/or operators in the district.

^{1/} See Exhibit 1 for definition of practices.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

D. Planned Project

1. Land treatment measures--cont'd

The sponsors estimate that 30 additional landowners or operators will become cooperators with the soil and water conservation district and develop conservation plans during the project installation period.

At present, 25,000 acres of the watershed have been soil mapped. Plans are to map an additional 10,100 acres during the installation period.

The SCS will provide the needed technical assistance to the S&WCD for soil surveys, conservation planning and application of conservation practices. Land treatment will consist of voluntary actions taken by individual landowners or operators.

2. Structural measures

The structural measures consist of approximately 12.2 miles of main channel work with 4.4 miles on Jordan Creek, 5.7 miles on Little Creek and 2.1 miles on Leak Ditch. Tributary structural measures consist of approximately 14.7 miles of new or reconstructed open ditches, 46.7 miles of surface drains, 5.1 miles of grassed waterway construction, 19.8 miles of tile in conjunction with surface drains and grassed waterways, and approximately 50 grade stabilization structures to provide controlled inlets for grassed waterways and surface drains into main channel and improved open ditches.^{1/} Also, about 1.5 miles of debris removal on Jordan Creek main channel is included.

Main channel work consists of channel enlargement and, where necessary, minor realignment. Construction on the Jordan Creek main channel starts near the center of Section 6, T22N, R9W, 1,800 feet downstream from a New York Central Railroad bridge and extends upstream to the junction of Jordan Creek and Leak Ditch located in the northwest quarter of Section 32, T23N, R9W. The work commences again on Jordan Creek main channel in the northeast quarter of Section 17, T23N, R9W, 1,150 feet upstream from a county road bridge and continues upstream to State Road 26. Little Creek construction extends from a county bridge on the west line of Section 7, T22N, R9W upstream to the center of Section 22, T22N, R9W. Leak Ditch construction will start west of Tab at a county road bridge located near the center of Section 30, T23N, R9W and continues upstream 5,600 feet to a county road bridge located on the west line of the southwest quarter of Section 19, T23N, R9W. Construction starts again 1,470 feet upstream from a county road bridge located approximately 1,000 feet east of the center of Section 18, T23N, R9W. Construction continues upstream to Indiana State Road 26.

^{1/} The term "surface drains" is an accepted local term which includes SCS specifications for Drainage Mains or Laterals (480) Open Channel (582)

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

D. Planned project

2. Structural measures - cont'd

The main channel improvements traverse primarily through glacial till in Reaches A, B, and D. Through Reaches C and E the glacial till is present in exposed banks of the channel, but is covered with glacial outwash in the valley which contains lenses of silts, clays, and gravels. Armor plating will be used to protect those soils encountered that are erosive or unstable due to the velocities within the channel.

Main channel design discharges were furnished by the planning hydrologist for Jordan Creek main through Reaches C and E, and for Leak Ditch and Little Creek through the lower parts of Reaches A and D, respectively. Design discharges for the remaining portions of the project are based on good agricultural drainage and the flood control provided by a 1-year cropping season level of protection. Less intense use of the rather narrow flood plain downstream from construction dictated less protection and, finally, termination of channel work.

The channel work will deepen the existing channel for drainage and also widen it where additional capacity is required. Channel work is planned to follow existing alignment. Excavation will be done from one side to reduce damage to wildlife habitat (Exhibit 4). Significant trees will be left standing on the constructed side, if at all practicable, during operations. In isolated cases where slope protection is required on the opposite bank, work may be done from both sides. All flow impeding brush and unstable or fallen trees will be removed from both banks. Removal will be carried out from the side designated for spoil. Armor plating (gravel blanket) will be used to protect unstable soils on the bottom and sides of the channel. The berm will be used as a maintenance travelway. A 15-foot vegetated buffer strip will be maintained on the unconstructed side to protect the channel from farming operations and also serve as a travel lane for wildlife.

The channel will be fenced to protect vegetative cover and/or vegetative buffer strip and wildlife planting where there is a potential for livestock use of the area adjacent to the channel. Markers will be used to delineate the boundaries of wildlife plantings and vegetative buffer strips. Openings will be left in the spoil to avoid induced stages on the unconstructed side. Appurtenances are planned for all reaches to safely lower surface water into channels. All existing tile outlets disturbed by construction will be replaced.

Inadequate tile outlets to Jordan Creek will be corrected by reconstruction of the tile line or by other means to provide a "free" outlet for existing tile.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

D. Planned project

2. Structural measures - cont'd

Work, as necessary, will take place on the unconstructed side to install appurtenances. Appurtenances on Little Creek include the construction of a multi-plate pipe arch approximately 96" x 159" to replace a county road bridge located on the north line of Section 20, T22N, R9W. The purpose of installing the pipe arch is 50 percent flood control and 50 percent drainage with flood control benefits being the elimination of induced flooding downstream of the road bridge. Care will be taken to minimize the disturbance of wildlife habitat.

The 1.5 miles of minor debris removal on Jordan Creek main channel runs from a point approximately 0.8 miles upstream of the Indiana-Illinois state line to the junction of Jordan Creek main channel and Little Creek, a distance of about 1.5 miles. The work involves mostly the removal of one logjam and the work will not affect the stability of the channel. The work will be done so as to minimize the disturbance of wildlife habitat. An interdisciplinary team comprised of representatives from the Indiana Department of Natural Resources, U.S. Fish and Wildlife Service, landowners and sponsors, and the SCS will participate in the development of design plans and specifications and operations and maintenance procedures. These cooperatively developed plans and specifications will be adhered to unless determined inappropriate during construction; however, all members of the team will be provided the opportunity to develop the necessary revisions.

Care will be exercised to minimize the amount of construction sediment. As a minimum, at least one trap will be used per mile of channel construction. The minimum size of the sediment trap will be 100 feet long and three feet deep (below channel bottom grade). Cleared material will be buried or disposed of by other acceptable means.

Archaeological sites identified during the archaeological reconnaissance survey of this project will be dealt with in accordance with the Archaeological and Historical Preservation Act (Public Law 93-291).

Access routes for construction equipment will be routed around the small knoll areas of archaeological significance to prevent disturbance of these areas. Any sites which lie within the easement area along the channel will not be leveled.

Land rights on main and tributary channels will consist of approximately 194 acres of permanent easements and approximately 455 acres of temporary easements. The permanent easement area will consist of approximately 69 acres of other land, 1/ 48 acres of woody vegetation, and 69 acres of cropland. The temporary easement area is in cropland. These

1/ Other land includes - channel bottom and side slopes and areas providing wildlife habitat adjacent to the channel.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

D. Planned project

2. Structural measures - cont'd

areas will not be available to the public without the permission of the landowner.

Woody vegetation will be established and maintained within the permanent easement area on approximately 27 acres to mitigate woody wildlife habitat destroyed by the structural improvements. A strip of trees and shrubs approximately 10 feet in width will be planted within the permanent easement on the spoil area. The vegetated buffer strip on the unconstructed side of the channel, within the permanent easement, includes existing woody material that can be utilized for wildlife habitat. Approximately 56 acres of grasses and legumes will be seeded on the disturbed areas within the permanent easement on the main channel.

Condensed profiles of the planned channel work are attached as Exhibit 6.

A variety of materials will be encountered during construction. A general description of materials, by reach, is tabulated below:

JORDAN CREEK

Reach B

101+00 to 235+00 -- Predominantly glacial till silty clay (CL) overlain by thin weathered till (ML or CL). Plasticity indices estimated to range between 10 and 20.

Reach C

410+86 to 508+00 -- Predominantly glacial till silty clay and silt (CL and ML) overlain by silt (ML) and clayey silts (ML or CL) with plasticity indices ranging between 10 and 20. Sands, gravel, silty sand and sandy silt near bottom in some areas (SC, ML, SM).

LEAK DITCH

Reach A

8+00 to 65+00 -- Predominantly silty and sandy clay glacial till with estimated plasticity indices ranging from 10 to 20.

170+12 to 226+22 -- Three to five feet of surficial glacial till (CL) with estimated plasticity indices of 10 to 20, overlying loose wet sand and clayey sand (SC, CL and SP).

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

D. Planned Project

2. Structural measures - cont'd

LITTLE CREEK

Reach D

23+60 to 225+00 -- Predominantly glacial till; 3 to 6 feet of firm, dense sandy and silty clay (CL) overlying wet, soft sand, silt and clay (SM, SC, ML, and CL), in turn overlying firm, moist, sandy clay (CL).

225+00 to 323+24 -- Sandy clay and silty clay (CL) overlying soft wet sandy clays and sandy silts (ML, CL, SM, and SC).

The tributary open ditch work will deepen (reconstruct) and construct (new) about 14.7 miles of channel. The open drains will be located as shown on the project map, Appendix B. The work will be to provide surface and subsurface drainage outlets. The open drains will have a bottom width of 4 feet, 2:1 or flatter side slopes, and shaped spoil banks. In areas where wildlife habitat exists, construction will be in accordance with Exhibit 4. A picture of a typical open drain is shown in Exhibit 2.

The tributary work also includes approximately 46.7 miles of surface drains. Those with drainage areas less than 640 acres will be constructed in accordance with SCS specifications for Drainage Mains or Laterals (480) and those with drainage areas greater than 640 acres will be constructed in accordance with SCS specifications for Open Channels (582). The bottom width will vary from 8 feet and larger. Side slopes will be 4:1 or flatter and depths will vary from 1 foot to about 3 feet. The purpose of the surface drains is to remove surface water that otherwise would pond and cause crop damage. A picture of a typical surface drain is shown in Exhibit 2. The surface drains will be located as shown in the project map, Appendix B.

Five and one-tenth miles of grassed waterways will be constructed in locations as shown on the project map, Appendix B. The grassed waterways will be constructed in accordance with SCS specification 412. The cross sections will be parabolic with depths of 1 to 3 feet.

About 19.8 miles of tile with a diameter of 8 inches and larger will be installed in locations as shown in Appendix B. The tile will be installed in accordance with SCS specification 606. A typical tile installation is shown in Exhibit 2.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

D. Planned Project

3. Operation and maintenance

a. Land treatment measures

The land treatment measures will be operated and maintained by the owners and operators of farms under voluntary cooperative agreement with the Warren County Soil and Water Conservation District. Technical assistance will be provided to the Soil and Water Conservation District by the Soil Conservation Service.

Forest land treatment measures will be voluntarily maintained by the landowners with technical assistance furnished by the Indiana Department of Natural Resources in cooperation with the U.S. Forest Service under the going Cooperative Forestry Program.

b. Structural measures

Operation and maintenance costs include all necessary expenditures after installation to realize the estimated benefits during the project evaluation period.

The sponsoring local organization will assume responsibility for operation and maintenance of all measures including measures for fish and wildlife. The operation and maintenance work will consist of such items as spraying or controlling of adverse vegetative growth within the channel and on channel side slopes, removing debris and/or excavation of shoal deposits as required to reduce serious bank erosion, maintaining channel capacity, repairing of critical areas by seeding, sodding or placement of riprap, and protection of project mitigation features within the permanent easement areas. Operating agreements will include provisions as indicated in the revegetation plan. Operation and maintenance activities will be conducted in a manner to minimize adverse environmental effects. State and federal agency restrictions on pesticides will be recognized when providing maintenance on project rights-of-way.

The Jordan Creek Conservancy District will be responsible for the operation and maintenance of the structural works of improvement installed within the watershed. It has the authority to finance this work by either taxation or special assessment. The District shall budget annually the necessary funds to meet the probable expenses of operation and maintenance plus 10 percent to meet contingencies.

Annual operation and maintenance cost for works of improvement is estimated to be \$15,850.

A period of time is prescribed to provide for the establishment of adequate vegetative cover for channels. This "establishment period" shall extend for up to three years from the date the structural works

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

D. Planned Project

3. Operation and maintenance

b. Structural measures cont'd

of improvement are accepted from the contractor as being completed. The establishment period is to terminate when any of the following conditions are met:

- a. Adequate vegetative cover is obtained;
- b. Two growing seasons have elapsed after the initial installation of vegetative work;
- c. Three years after completion of works of improvement.

The Soil Conservation Service and the local sponsors have agreed to accept some minor deviation in the design criteria of some channels recognizing a degree of risk is involved in establishing their stability. Additional work may be necessary during the establishment period to achieve the desired stability.

During the establishment period for vegetative measures, SCS may approve PL-566 cost-sharing for additional work required to obtain an adequate vegetative cover. Approval of SCS is also required for PL-566 cost-sharing for other repair or additional work on completed structural works of improvement. Requests for approval will be considered if:

- a. The need is determined during the establishment period;
- b. The need results from latent conditions unknown to both SCS and the sponsor;
- c. PL-566 cost-sharing requested for the repair of additional work does not exceed the ratio authorized for the original construction of the specific work involved; and
- d. Performance of the repair or additional work does not lessen or adversely affect the legal liability of the construction contractor or his surety to bear the cost of the work.

A Soil Conservation Service representative will make a joint inspection with the sponsors annually; after severe floods and after the occurrence of any unusual conditions that might adversely affect the structural measures. These joint inspections will continue for three years following the acceptance of the works of improvement for operation and maintenance by the local sponsors. Inspections after the third year will be made annually by the sponsors. A report will be prepared of any such inspections making sure that the Service representative receives a copy. The Indiana Department of Natural Resources will be informed of any scheduled inspections. A record of each inspection will be kept in the sponsor's file and will be available for authorized inspection.

Specific operation and maintenance agreements and plans will be executed between the sponsor and the Soil Conservation Service prior to signing

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

D. Planned Project

3. Operation and maintenance

b. Structural measures - cont'd

land rights, relocation or project agreements. These agreements will use as a basis the SCS State Watershed Operations and Maintenance Handbook. These agreements will contain, in addition to specific sponsor responsibilities for nonstructural and structural measures, specific provisions of OMB Circular A-102 for retention and disposal of real and personal property acquired in whole or in part with PL-566 funds.

4. Project costs

The total installation cost is estimated at \$2,528,470 of which \$1,181,160 is PL-566 cost and \$1,505,970 is Other cost. The construction cost for the structural measures is estimated at \$1,133,000 of which \$822,320 is PL-566 cost and \$310,680 is Other.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

1. Physical resources

Jordan Creek Watershed contains an area of approximately 35,123 acres or 54.9 square miles and is located in northwestern Warren County, Indiana. Relative locations of some important cities follow: Danville, Illinois, 12 miles southwest; Hoopeston, Illinois, 13 miles west; Hammond, Indiana, 75 miles north; Lafayette, Indiana, 30 miles east; and Indianapolis, Indiana, 75 miles southeast.

The watershed is not within any Standard Metropolitan Statistical Area (SMSA). The 1970 census shows Warren County, Indiana, to have a population of 8,705. The county is classified as rural with the population listed as 76.4 percent rural non-farm and 23.6 percent rural farm. Estimated population of the watershed is 704 with approximately 7 percent occupying the unincorporated villages of Tab, Stewart and Pence, Indiana.^{1/}

Present land use within the watershed with approximate acres and percent is as follows: cropland, 94.5 percent (33,200 acres); pasture, 1.8 percent (640 acres); forest land, 0.1 percent (25 acres); and other, 3.6 percent (1,260).

A high level of agricultural production may be sustained even though a certain amount of soil is lost each year to erosion. The tolerable limit of soil loss is being exceeded on 8,400 acres of cropland scattered throughout the watershed. An additional 26,800 acres of cropland is on mineral soils having a wetness limitation for crop production.

An average of 1,390 acres is affected annually by overbank flooding. Approximately 15,920 acres have joint, inseparable flooding and drainage problems.

The climate within the watershed is typical of the region. Average annual precipitation is about 37 inches. Distribution is nearly cyclic, varying from a low monthly average of 2.26 inches in February to a high of 4.66 inches in June. Fifty percent of the precipitation falls in the growing season, often as high intensity rainfall. Snowfall varies considerably from year to year, but averages 24 inches with 4 to 5 inches each month from December through February.

^{1/} 1970 Census of Population, Advance Report, PC (VI) - 16, Indiana:
U.S. Department of Commerce, Bureau of the Census, December 1970.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

1. Physical resources - cont'd

Average daily maximum temperatures range from a low of 37° in January to a high of 87° in July. Average daily minimums range from a low of 23° in January to a high of 65° in July. Average daily temperature ranges from 29.7° in January to 76.3° in July. An average of 30 days per year have a maximum temperature over 90°, and the temperature falls below freezing an average of 120 days. The growing (frost-free) season averages 170 days. Average annual sunshine is 2,650 hours. There are usually 45 days a year with thunderstorms. 1/ & 2/

This watershed is within National Land Resource Area (NLRA) 110, the Northern Illinois and Indiana Heavy Till Plain. 3/ It is also covering central Indiana and characterized by nearly flat to gently rolling topography that has undergone slight modification by post-glacial streams. The altitude ranges between about 675 feet above mean sea level near the Indiana-Illinois state line to about 830 feet in the extreme northeastern part of the watershed, a maximum relief on the order of 155 feet. Local relief ranges from a few feet to about 50 feet, averaging somewhat less than 20 feet over much of the watershed.

The thickness of glacial drift ranges between approximately 100 and 200 feet. The surficial glacial materials consist predominately of fine-grained glacial till in the form of ground-moraine and end-moraine deposits.4/

Small, scattered areas of kame deposits (ice-contact stratified gravel, sand and silt) and lacustrine deposits of muck, peat or marl are present within the watershed. Alluvial silts, sands and gravels associated with valley-train deposits of gravel and sand are present along much of Jordan Creek.

Soils in the watershed are shown on the General Soils Map by soil association. A soil association is a landscape that has a distinctive proportional pattern of soils. It consists of two or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

1/ Annual summary, Climatological Data Indiana: U.S. Department of Commerce, NOAA, EDS, vol. 76, November 13, 1971.

2/ The National Atlas of the United States of America: U.S. Department of the Interior, USGS, 1970.

3/ "Land Resource Regions and Major Land Resource Areas of the United States," Atlas of River Basins of the United States, USDA, SCS, 1970.

4/ Geologic Map of the 1°X2° Danville Quadrangle, Indiana and Illinois Showing Bedrock and Unconsolidated Deposits, Regional Geologic Map No. 2, Indiana Geological Survey, 1966.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

1. Physical resources--cont'd

The table "Estimated Soil Limitations or Suitabilities for Selected Uses" is to be used in conjunction with the General Soils Map. The table lists the percentage of each soil association and the limitations and suitabilities of the major soils for specific land use.

The General Soils Map, limitation table and soil association descriptions are found in Exhibits 7A through 7D.

Bedrock of Pennsylvanian age crops out beneath the glacial drift. The dominant lithologies are sandstone and shale with lesser amounts of limestone, clay and coal.

There are no mineral resources being mined or produced in the watershed. Some sand and gravel is present in the outwash deposits and widely scattered stratified drift. Neither of these resources is being commercially utilized. Although the Minshall Coal is present in the Pennsylvanian bedrock, the quality and quantity of the coal resources is such that mining is not likely to occur. 1/

Two ponds occur in the watershed. They have a total surface area of about one acre.

All lateral ditches and the upper reaches of main Jordan are intermittent (continuous flow through some seasons but little or none through others) and man-made or modified. The remaining streams are perennial (flows at all times except during extreme drought) and man-made or modified.

There are no known areas of wetland types 3, 4, or 5 in the watershed.2/ The areas that receive annual flooding and depressional ponds in the upper reaches are classified as type 1 wetlands. Cropland comprised approximately 80 percent of these wetlands with the remainder being grassland and other land.

Reach E of Jordan Creek begins at the Indiana-Illinois state line and proceeds upstream in Indiana to the junction of the Little Jordan Creek.

Upstream from the state line, the channel is shallow and flat bottomed, about 50 feet in width, and 3 to 1 side slopes with the flood plain being in cropland. The channel northwest of Pence, Indiana, has a flat bottom with a double channel creating a wooded island and pastureland and cropland

1/ Harold C. Hutchinson, Distribution, structure, and mined areas of coals in Fountain and Warren Counties and the northernmost part of Vermillion County, Indiana, Preliminary Coal Map No. 9, Indiana Dept. of Conserv., Geol. Surv., 1961.

2/ Wetlands of the United States: U.S. Dept. of the Interior, Fish and and Wildlife Service, Circular 39, 1971.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

1. Physical resources--cont'd

on the field sides. The channel is 4 to 8 feet deep with varying side slopes from 2:1 to 4:1. The flood plain gains width, and the entrenchment becomes shallower. The forest land is less dense but the reach contains a higher percentage than the remainder of the watershed. North and east of Pence to the end of Reach E the channel varies in width but averages approximately 4 feet in depth. The flood plain contains scattered trees and grasses with pastureland being the primary land use.

Reach C, beginning at the junction of Little Jordan Creek and ending at the junction of Leak Ditch, has a V-shaped valley. The channel averages about 25 feet in width but is 4 to 7 feet deep with 2:1 side slopes. There are some trees scattered along the channel and limited pasture in the lower levels of the flood plain, but the flood plain is predominantly cropland.

Reach B beginning at the junction of Leak Ditch proceeding upstream on Jordan is no longer entrenched but is a drainage ditch with side slopes of about 2:1. The channel varies in width from 16 feet to 2 feet and is trapezoidal in shape with depths of 2 feet to 5 feet.

Reach A from the junction of Jordan Creek upstream on Leak Ditch is a drainage ditch and is trapezoidal with the following approximate dimensions: depth--4 feet, side slopes--2:1 and width--10 feet.

Reach D from the junction of Jordan Creek upstream on Little Jordan Creek is a drainage ditch, trapezoidal in shape, ranging in bottom width from 20 feet to 10 feet and having 2:1 side slopes with a depth of approximately 4 feet.

Reaches A, B and C, Leak Ditch, Jordan and Little Jordan Creek are man-made channels for removal of surface and subsurface water to enhance the agricultural development. Sedimentation has occurred in portions of these channels since their early construction.

There are no stream gages in the watershed. The nearest gage is downstream on Vermilion River in Danville, Illinois, and serves an area of 1,280 square miles. Jordan Creek Watershed contributes only 10 percent of the drainage area of the gage.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

1. Physical resources - cont'd

Groundwater resources are sufficient for local needs in the watershed. Locally good supplies are obtained from sand and gravel deposits located within the glacial drift. These sand and gravel deposits usually provide adequate water for rural, domestic and livestock use. Well yields are normally in the range of 50 to 150 gallons per minute. 1/

The town of Pence, located near the lower end of Jordan Creek (one mile east of the Indiana-Illinois state line), has a municipal water supply system. Two wells drilled 115 feet deep supply 100 people with an estimated 36,600 gallons per day. The physical and chemical characteristics are as follows. 2/

	<u>Unit</u>	
pH	No.	7.0
Color (S.U)	Color Units	5
Turbidity (S.U.)	Jackson Units	0.2
Hardness (CaCO ₃)	Mg/l	298
Calcium (Ca)	Mg/l	72
Magnesium (Mg)	Mg/l	28
Sodium (Na)	Mg/l	46
Potassium (k)	Mg/l	5
Iron (Fe)	Mg/l	0.8
Manganese (Mn)	Mg/l	0.04
Alkalinity	Meg/l	396
Chlorides	Mg/l	3
Sulfates (SO ₄)	Mg/l	2
Nitrates (N)	Mg/l	0.1
Fluorides (F)	Mg/l	0.3

As part of a biological review, the IDNR, Division of Fish and Wildlife made a simple water quality assessment of Jordan Creek in December, 1974. They found a temperature of 51° F, dissolved oxygen content of 12 ppm, and a pH of 8.0. They stated that water quality appeared good in the area, and the stream bottom looked quite productive. 3/

The USGS, Water Resources Division in Indianapolis conducted a water quality assessment of the watershed to delineate existing and potential water quality problems.

1/ Unpublished material prepared for the State Water Plan by the Groundwater Section, Division of Water, IDNR.

2/ Indiana State Board of Health, Data on Indiana Public Water Supplies, Bulletin #S.E. 10, 1968.

3/ Jordan Creek Stream Survey Report, IDNR, Division of Fish and Wildlife, December 1974.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

1. Physical resources - cont'd

Reconnaissance sampling was conducted at nine sites on September 24, 1974. All nine samples were taken directly from the streams. Field water quality and stream flow measurements were made and samples were collected for laboratory analysis for some or all of the following: common inorganic constituents, selected metals, nutrients, bacteria, insecticides and certain fractions of the biologic community. Water quality and analytical data is found in Exhibit 11.

For the most part, stream waters in Jordan Creek watershed were of good quality and were similar with respect to specific conductance and concentrations of dissolved solids, major cations, and major anions.

Temperature, pH, and dissolved oxygen content were typical of the times and existing flow conditions.

Dissolved manganese exceeded that desired for water supply, but was well within the limitation for agricultural uses.

Nutrient concentrations, nitrate, phosphate, and organic carbon were typical for an agricultural watershed and should not be a problem with respect to public use. The data gathered indicate nutrient levels are not likely to cause enrichment and undesirable biologic growth; however, higher concentrations of nitrate during winter and spring flows could present a slight problem.

Fecal coliform and fecal streptococci bacteria concentrations measured in the watershed were moderate and very low, respectively. Concentrations indicate some contamination from sewage effluent and animal wastes, but levels were not alarmingly high.

Low concentrations of dieldrin, DDD, and DDE were found in bottom samples of Jordan Creek. These concentrations have the potential for accumulating in local biological food chains; however, present concentrations have not affected biological index. Future levels of concentrations are not expected to be alarming. 1/

1/ A Water-Quality Assessment of the Jordan Creek Watershed, Warren County, Indiana, USGS, Water Resources Division, Indianapolis, 1975.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

2. Present and projected population

The 1970 census shows the population of Warren County, Indiana, as 8,705, a 1.9 percent increase above the 1960 population.

Area 058 and 059 as delineated by the Bureau of Economic Analysis, Department of Commerce, includes Warren County, Indiana, and Vermilion County, Illinois. The office of Business Economic Department of Commerce and the Economic Research Service, Department of Agriculture (OBERS) projections, prepared for the Water Resources Council, indicates the population for this area will about double from 1964 to 2020. Estimation for the project area was not attempted.

3. Economic resources

Principal economic activity in the watershed is agriculture. The agricultural area is under private ownership. Cash grain is the major farm enterprise. There are 184 farms in or partially in the watershed. Eighty-two are covered by cooperative agreements and have conservation plans with the Warren County Soil and Water Conservation District. The average size farm is 320 acres with the average farming unit being about 480 acres.

Current overall watershed land use is distributed 33 percent to corn, 17 percent to soybeans, 17 percent to wheat, 23 percent to meadow, 2 percent to sweetcorn, 3 percent to permanent pasture and 5 percent to forest and other uses. Crop yields for the watershed as a whole average 120 bushels--corn, 37 bushels--soybeans, 42 bushels--wheat, 3.5 tons--hay, and 5 tons--sweetcorn. Yields reflect a combination of productive soil, good management and adequate capital.

Land values vary in the watershed. The average value of upland is \$1,500 per acre, flood plain land is \$700 per acre and \$1,000 per acre for land with drainage problems.

Access to trade and market outlets is provided through a well developed network of roads. Indiana State Road 26 joins Illinois 9 to provide watershed access to points east and west. North-south traffic is served by Illinois State Road 1 to the west of the watershed and U.S. Highway 41 east of the watershed. Approximately 110 miles of county roads supplement these principal traffic arteries. Railroads serving the area are the Chicago and Eastern Illinois and the Penn Central.

Unemployment is not a problem in the watershed. Many of the farms employ full-time hired help or seasonal part-time help.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

4. Plant and animal resources

The watershed contains approximately 94.5 percent cropland, 1.8 percent pasture land, 0.1 percent forest land and 3.6 percent other. the cropland is used primarily for production of corn and soybeans and is evenly distributed throughout the watershed.

A large portion of the pasture land is found in the lower reaches of the watershed in the floodway. This pasture was originally established in the floodway to minimize crop losses caused by periodic flooding. The remainder of the pasture land is evenly distributed throughout the watershed.

All of the forest land is privately owned with only 25 acres being located in the watershed. The average forest land is unevenly distributed with concentrations in the downstream portions along the creek bottoms and adjacent upland. Stands are predominantly hardwood with the principal forest type oak-hickory. About 70 percent of forest stands are sawtimber size, 10 percent pole size, and the remaining 20 percent understocked. Adequate forest fire protection is provided by the Indiana Department of Natural Resources in cooperation with the U.S. Forest Service through the Clarke-McNary Cooperative Forest Fire Control Program.

Wildlife habitat provided by the woody cover is limited in extent, however, it is quite desirable in quality for those wildlife species most predominant in the watershed. For the most part woody habitat is found adjacent to the streams and along railroad rights-of-way.

The IDNR, Division of Fish and Wildlife census information shows populations of cottontail rabbit as light to moderate, bobwhite quail as light to moderate, ring-neck pheasant as moderate, squirrel as light, and deer as light over most of the watershed.

Ring-neck pheasant hunting is most important and accounts for over 80 percent of all hunting efforts in the area. Pheasants and bobwhite quail are common in grassy areas at the edge of woods, in the more open woods and throughout cornfields. Rabbit, squirrel and quail hunting comprise most of the hunting within the watershed.

Other important game and fur species which occur in the watershed include woodcock, raccoon, muskrat, opossum, striped skunk, red fox, and mink. See Exhibit 9 for mammals occurring in the vicinity.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

4. Plant and animal resources - cont'd

Populations of aquatic wildlife are light due to the general lack of wetland habitat throughout the watershed. However, several small type 1 wetlands are scattered throughout the topography in the form of depressional areas.

Songbirds of over 100 species use the limited woody cover which serves as a safe travel lane through large areas of cropland. Tall trees are nesting places for the great horned owl, red-tailed hawk, Baltimore oriole, scarlet tanager and many others. Dead and mature hollow trees provide suitable nesting sites for wood duck and invite flickers, red-headed woodpeckers, bluebirds, sapsuckers, house wrens and up to 35 other species of birds that use den trees. Shrubby border and fence rows attract the cardinal, mockingbird, catbird, cedar waxwing, brown thrasher indigo bunting, goldfinch, song sparrow, vireo and chipping sparrow. See Exhibit 9 for species of wildlife identified within the watershed.

The sport fishery in Jordan Creek is limited due to the silted condition of the channel. Most of Jordan Creek consists of low gradient, heavily silted channels except for a short stretch immediately above and below the confluence of Little Creek and Jordan Creek.

A simple water quality assessment was made during the fishery survey by IDNR. Water quality approved satisfactory for fish production with approximately 12 ppm dissolved oxygen and pH of 8. 1/ Data gathered by USGS, Division of Water, indicated nutrient levels are not likely to cause enrichment and undesirable biologic growth. Higher concentrations of nitrate during winter and spring flows could present a slight problem. The higher concentrations of nitrate should not be detrimental to the sport fishery.

Low concentrations of dieldrin, DDD, and DDE have the potential of accumulating in local biological food chains, however, present concentrations have not affected the biological index. Present biological condition in the stream is good. Future concentration levels of insecticides are not expected to be alarming.2/

1/ Jordan Creek Watershed Fishery Survey Report: IDNR, 1974

2/ A Water-Quality Assessment of the Jordan Creek Watershed, Warren County, Indiana. USGS, Water Resources Division, Indianapolis, 1974.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

4. Plant and animal resources - cont'd

The following is taken from the IDNR Fishery Survey Report:

"The present 'natural' section of the stream is so small in relation to the 'modified' section that in its present condition Jordan Creek can neither support a significant sport fishery nor maintain much vestige of a 'natural' stream population. However, if the extremely silted condition of the stream channel could be corrected and maintained, it is quite possible that the fish population (both game and nongame) will show marked improvement.

Because reduction of silt is one of the objectives of the proposed project it is important to retain as much of the 'natural' portion of the stream as possible to serve as a spawning and rearing area. Following completion of the channeling project this portion of the stream could be stocked with game fish.

Loss of the productive, hard-bottomed, natural portion of the stream could mean loss of valuable invertebrate population. If the natural portion of the stream could be retained existing populations could serve as an invertebrate source for repopulation of the newly 'cleaned' channel."

No rare or endangered species have been identified as being dependent upon habitat conditions in this watershed.

Most of the land within the watershed is privately owned and public access to the existing resources is available only by permission of the landowners.

5. Recreational Resources

There are no existing private or public recreational enterprises located in the watershed. The watershed is predominately agricultural with 94.5 percent of the land use being cropland and only 0.1 percent forest land.

No potential areas have been identified for major recreational development in Indiana. 1/ However, to a limited extent, individual recreation activities such as bird watching and hiking exist along the lower reaches of Jordan Creek in Indiana. Hunting of ring-neck pheasant is common throughout the watershed.

There are existing needs for picnic areas, camping areas, playfields, bicycling paths, horseback riding trails, nature walks, hunting

1/ Warren County Soil and Water Conservation District, An Appraisal of Potentials for Outdoor Recreational Developments in Warren County, Indiana, (undated).

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

5. Recreational resources--cont'd

areas, swimming areas, and fishing waters in the watershed. The items mentioned would be consistent with the potential resources that exist within the watershed.1/

6. Archaeological, historical and unique scenic resources

There are no entries for Warren County, Indiana in the National Register of Historic Places and Natural Areas in Indiana and their Preservation.2/ & 3/ The Indiana Guide to Historic Places lists several places of historic interest in the county; however, none of the sites are located within the watershed.4/ There are no known sites eligible for inclusion in the National Register of Historic Places.

An archaeological study by the Indiana Historical Society was completed in May 1975. Twenty-eight sites were identified.5/ Eight of these sites were found within the temporary easement and could possibly be disturbed. However, only four sites were considered to be significant enough to retain in their natural state or be salvaged. The other twenty sites lay outside of the easement area.

The survey revealed that much of the watershed area was once part of the Arcadia hunting grounds. A predominance of the diagnostic material found belongs to the Archaic Tradition, which dates from 8,000 B.C. to about 1,000 B.C. Later habitation by Woodland and Mississippian populations is only poorly represented if at all. There was no evidence of either a single large or long-term occupation of the sites.

Where the four sites with significant value would be affected by the proposed works of improvement, proper procedures will be taken to preserve these sites by altering construction.

The State Historic Preservation Officer and the National Park Service will be notified if artifacts or other items of archaeological or historical significance are uncovered during construction.

1/ An Appraisal of Potential for Outdoor Recreational Development in Warren County, Indiana: Warren County Soil and Water Conservation District.

2/ National Register of Historic Places: National Park Service, Feb. 1973.

3/ Natural Areas in Indiana and Their Preservation: Department of Biology, University of Notre Dame, May 1970.

4/ Indiana Guide to Historic Places: Indiana Department of Commerce, 1973.

5/ Archaeological Survey of the Jordan Creek Watershed: Indiana Historical Society, 1975.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

7. Soil, water and plant management status

The present trend in land use is essentially stable with only a slight decrease each year in cropland and pasture. Forest land remains the same with a slight increase in other land. Changes during the life of the project are summarized below:

	<u>Cropland</u>	<u>Pasture</u>	<u>Forest Land</u>	<u>Other Land</u>
Present	33,198	640	25	1260
Future	33,185	631	25	1282
Change	-13	-9	0	+22

The change in land use as indicated above is attributable to economic and technical conditions rather than project action. Some factors involved in the change are: the high cost of land, equipment, labor and capital. These factors have combined to encourage the farm operator to specialize (produce one commodity) instead of diversify (produce several commodities). The comparatively low profit margin in livestock production is expected to result in the conversion of some pasture to cropland. Also, long term investment pressures and a general shortage of readily available or accessible cropland will tend to encourage the farm operator to remove timber from the present forest land that can be used as cropland. In summary, the future change in land use is not project oriented.

Adequate local funds are available for applying needed individual farm land treatment practices. There is a shortage of local contractors to apply conservation practices.

Approximately 26,800 cropland acres of mineral upland soil have an inherent drainage problem that has been partially corrected. Additional drainage is needed for most efficient use of this land as cropland.

Soil loss on 8,400 acres of gently to moderately sloping cropland exceeds tolerable limits. This excess soil loss decreases the productivity of the land, increases production costs of crops and contributes to downstream sediment pollution. Adequate conservation practices will be applied to reduce average annual soil loss to a tolerable limit of 3.5 tons per acre.

The watershed is serviced by the Warren County Soil and Water Conservation District, which provides technical assistance to landowners and operators in the preparation of conservation plans and the application of land treatment measures.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

7. Soil, water and plant management status - cont'd

Adequate forest fire protection is provided for the forest land by the IDNR, Division of Forestry in cooperation with the U.S. Forest Service through the Clarke-McNary Cooperative Forest Fire Control Program.

There are 184 farms in the watershed and 123 (67 percent) of the farms have conservation plans with the soil and water conservation district.

Acres and percentages of land considered adequately treated by land use are: 6,450 acres cropland, 19 percent; 260 acres pasture, 63 percent; 10 acres forest land, 40 percent; and 590 acres other, 98 percent. This represents 7,345 acres which comprise 21 percent of the total watershed.

Conservation practice units needed in the watershed and percent applied on the land are as follows:

<u>Practice 1/</u>	<u>Practice Unit Needed</u>	<u>Percent Applied</u>
Contour Farming	340 Ac.	85%
Grade Stabilization Structure	80 No.	26%
Grassed Waterway or Outlet	100 Ac.	30%
Conservation Cropping System	26,000 Ac.	39%
Minimum Tillage	27,300 Ac.	32%
Crop Residue Use	18,000 Ac.	40%
Subsurface Drains	323,840 Ft.	20%
Pasture and Hayland Management	150 Ac.	57%

Cost sharing for some conservation practices is available through the Agricultural Stabilization and Conservation Service which administers the Agricultural Conservation Program.

1/ See Exhibit 1 for definition of practices.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

E. Environmental setting

8. Projects of other agencies

Lake Vermilion, the 690 acre major water supply for Danville, Illinois, is located on the North Fork of Vermilion River 13 miles downstream from Jordan Creek. No benefits are expected to accrue to the Jordan Creek project from Lake Vermilion. However, the installation of sediment traps during construction of Jordan Creek, immediate revegetation of disturbed areas during construction, and the long term effect on reduction in sediment delivery downstream from Jordan Creek as a result of installation of additional land treatment measures should enhance the Lake Vermilion project.

(The Jordan Creek Watershed project is an action-pending project for the Comprehensive Coordinated Joint Plan (CCJP) developed by the Ohio River Basin Commission for the Wabash Basin. Adoption into the CCJP is expected upon completion of the final work plan and environmental impact statement.)^{1/}

There are no other water resource development projects in operation or being considered by other agencies or groups that would affect or be affected by the installation of measures proposed in this work plan.

^{1/} Wabash River Basin Comprehensive Study, Vol. 1, Main Report, June, 1971.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

F. Water and related land resource problems

1. Land and water management

Many areas of the watershed now under cultivation have soils with erosion problems and drainage limitations. The ability of these soils to sustain efficient production depends on the establishment and maintenance of needed conservation measures. (See Exhibit 2)

Flooding and drainage is a problem on approximately 15,920 acres in the watershed. The average annual area subject to overbank flooding is 1,390 acres.

Most severely affected within the water problem area are scattered surface depressions and low areas adjacent to inadequate channels. Damaging effects are expressed through impaired root and plant growth, increased disease, greater competition from weeds, reduced crop quality and delayed field work. Low economic returns do not permit the landowners to apply management for top efficiency.

Overall economic capabilities of landowners and operators present no limitation to application of conservation practices. There is a need for additional conservation contractors. However, this factor is not expected to seriously delay implementation of needed practices.

There is a continuing need for information and education programs to effectively reach and motivate the landowners and operators who must carry out the land treatment measures.

2. Floodwater damages

Frequent flooding occurs on land adjacent to principal watershed drainage channels. Flood problems are most severe on Leak Ditch from the vicinity of Tab, Indiana, (Reach A) downstream to its junction with Jordan Creek; on Jordan Creek from Tab (Reach B) downstream to Pence (Reach E); and on Little Creek (Reach D) from the vicinity of Stewart, Indiana, downstream to its junction with Jordan Creek.

Areas flooded vary in width from a few hundred feet to a maximum of one quarter mile. Approximately 1,881 acres of land within the watershed are inundated by a large flood (100-year frequency), 1,069 acres by a medium size flood (5-year frequency), and 514 acres by a small flood (1-year frequency).

Land use within the flood plain is primarily agricultural. Of the total area subject to flooding 45 percent is cropland, 42 percent pasture land, and 13 percent woodland and other land. Corn occupies two-thirds of the cropland acreage and soybeans one-third.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

F. Water and related land resource problems

2. Floodwater damages - cont'd

Greatest concentrations of cropland occur along Leak Ditch and Jordan Creek in the vicinity of Tab, along Jordan Creek, and along Little Creek. Cropland in these areas accounts for 70 to 75 percent of the flood plain. Cropland in other flood plain areas ranges from 35 percent on Jordan Creek Reaches C and E to 15 percent on the most downstream segments of Jordan Creek.

Damages occurring on agricultural areas from overflow include reduced crop and pasture yields, increased crop production costs, and increased maintenance expenses on flood plain improvements. Annual value of future crop and pasture damages without project average \$11.47 per flood plain acre. Constraints to flood plain land use and crop production processes are a factor on Jordan Creek (Reaches C and E).

Flood damages to nonagricultural values are reflected primarily as increased road and bridge maintenance expense. In total, 17 county roads and 8 railroad bridges cross the channels within the flood zone outlined at the beginning of this section. Damages on an annual basis are, for the most part, insignificant on railroad bridges. Damages to county roads and bridges in the watershed typically occur yearly.

3. Erosion damages

Erosion is not a severe problem in the watershed. The greatest soil loss occurs on about 8,400 acres of cropland which is susceptible to sheet erosion. The estimated average soil loss is .5.7 tons per acre annually. The average soil loss tolerance is approximately 3.5 tons per acre annually. About 26,800 acres of cropland occur on depressional soils which normally yield very minor quantities of sediment. The estimated average soil loss from the total cropland acreage of the watershed is about 1.4 tons per acre annually.

Streambank erosion contributes an estimated 5 percent of the gross erosion. Erosion from roadside ditches, built-up areas, and farmsteads contribute an estimated 5 percent of the total gross erosion within the watershed. There is some wind erosion within the watershed due primarily to fall plowing, a common practice in the watershed.

The major soil erosion areas are scattered throughout the two soil associations (Sidell-Dana-Darroch and Raub-Chalmers-Darroch). The associations parallel the streams and extend along the east edge of the watershed.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

F. Water and related land resource problems

4. Sediment damages

Sediment damages are not a severe problem. Some roadside ditches and drainage channels accumulate sediment. However, the problem is minor in relation to the total floodwater and drainage problems. Improved agricultural management practices and the application of needed land treatment measures should alleviate the problem of sediment accumulation in roadside ditches and drainage channels.

Sediment yield from the watershed is estimated at approximately 12,000 tons annually (about 0.33 tons per acre annually).

5. Joint problems (flooding and drainage)

Agricultural drainage problems exist because of shallow channels and lack of channel capacity. Open and closed drains are restricted during floods. The most significant problems are recurring patterns of drainage impairment and flooding which occurs throughout the growing season. Damaging effects are expressed through impaired root and plant growth, increased plant disease, greater competition from weeds, reduced crop quality and delayed field work. Reach A contains 2,107 acres with joint problems; Reach B, 4,521 acres; Reach C, 1,709 acres; Reach D, 4,715 acres; Reach E, 2,368 acres; and Reach J, 504 acres.

Due to the existing flooding and drainage problems, crop production costs are higher and crop yields are lower when compared with production on land without these problems. Thus, less maintenance, labor, and material are applied by landowners and operators in the problem areas. Average annual yields in the area affected by poor drainage outlets are reduced by an estimated 26 bushels per acre for corn and 12 bushels per acre for soybeans.

The lack of adequate drainage outlets in the upper reaches of Little Creek, Leak Ditch, and Jordan Creek has resulted in a large portion of these drains becoming unserviceable. In some sections, drains are now inadequate for either passage of floodwater or to serve as suitable drainage outlets. Additional depth and capacity are needed to provide adequate outlets on the upper reaches of all three tributaries.

The most severely affected problem areas studied are scattered surface depressions and low areas adjacent to inadequate channels. These areas for ease of future discussion will be labeled Problem Sub-Area 1. Storm runoff concentrations in these areas remain for prolonged periods of time. Crop yields are greatly reduced, and complete crop failure is frequently a result of prolonged ponding.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

F. Water and related land resource problems

5. Joint problems (flooding and drainage) - cont'd

Surrounding these areas of severe water problems are fringe areas of soils which, although not subject to ponding or flooding, remain saturated for long periods of time (Problem Sub-Area 2). Yields in these areas, although acceptable, do not reflect the inherent production potential of the soil. Yields of row crops are depressed on an average of 20 to 30 percent due to the drainage problems.

Reduced crop yields are experienced on still other portions of the overall water problem area. These areas are designated here as Problem Sub-Area 3. This area often occurs on the landscape in close association with Problem Sub-Areas 1 and 2, but may occur separately as well. For the most part, their margins follow normal field boundaries. They represent areas where less than optimum timing of field operations are possible due either to the presence of Sub-Areas 1 and 2 within a given field, or to the presence of random areas of imperfect drainage. Extent of current yield reductions on these areas is not highly significant--5 to 10 percent. However, with an ever increasing level of technology, it is expected that the yield limitations presented by disruptions in the timing of field operations will become increasingly more significant.

6. Recreation problems

Individual recreation activities such as hunting, bird watching, hiking, nature walks, fishing, and picnicking, with the landowners' permission, are the only activities available to the general public in the watershed.

There are no surface water areas in the watershed for use by the public. There are two privately existing ponds in the watershed.

The watershed is in the Bureau of Economic Analysis Areas 058 and 059. Warren County lies in Area 059 which has a projected population of 388,800 for the year 2000 compared to 249,412 in 1969.

Present recreation needs for these areas include the following facilities: hunting areas, nature and hiking trails, horseback riding paths, bicycling paths, camping areas, and picnicking areas. Needs exist for water-related activities such as fishing, swimming, boating, water skiing, and canoeing. There appears to be available resources to meet all needs except for water-related recreation.^{1/}

^{1/} State of Indiana, Shaping the Future, Indiana Recreation Plan, September 1970.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

F. Water and related land resource problems

7. Plant and animal problems

The original vegetation for the area was primarily prairie grass. The minimal amount of forest land and wildlife and recreation land present provides very limited cover for wildlife. The Chicago and Eastern Railroad right-of-way is in the process of being returned to cropland by private owners. The loss of the old railroad right-of-way along with channel work for flood control and drainage will be detrimental to the existing wildlife resources. A continuing detrimental effect will last the life of the project unless redevelopment is planned, established, and maintained. An improved balance of land use to provide fish and wildlife habitat is desirable.

Since 94.5 percent of the watershed is cropland, the wildlife will be substantially influenced by the agricultural land use and management practices. Farm ponds, wildlife habitat development and erosion-control practices that establish vegetative cover are beneficial to wildlife.

The forest land ownership pattern is scattered, and only 25 acres of forest land occur in the watershed. The narrowness and limited length of much of the wooded areas along the streams reduce their importance for large mammals, such as white-tailed deer, but small mammals, birds reptiles, and amphibians make use of these areas. The present hydrologic condition of the forest land varies from very poor to poor; however, the potential of this land to improve hydrologically is high. Livestock grazing has eliminated ground cover in certain areas, exposing the soil to erosion; however, erosion and sediment yields are minimal. The primary problem is bringing woodland under improved management.

The watershed is short of surface water as habitat for fish and wildlife and for recreational use. Any substantial increase in installed and managed fishery waters would benefit these resources.

Water quality in the streams is good except for small quantities of agricultural sediment and chemicals (see Environmental Setting - Physical Resources).^{1/}

8. Water quality problems

Water quality is generally good for agricultural use although fertilizers and insecticides are potential problems. A detailed account of water quality is presented in the Watershed Resources - Environmental Setting, Physical Resources section.^{1/}

^{1/} A Water Quality Assessment of the Jordan Creek Watershed, Warren County, Indiana, USGS, Water Resources Division, Indianapolis, 1974.

III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

F. Water and related land resource problems

9. Economic and social problems

The median income per family in Warren County, Indiana, for 1970 was \$8,340. The median income per family for the State of Indiana in 1970 was \$9,970. The median income for all farm families in the county was \$8,293 and for the state was \$8,198. 1/

1/ U.S. Department of Commerce, General Social and Economic Characteristics, 1970.

IV. RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

The Jordan Creek Watershed is developed primarily for agricultural purposes. The soils are considered prime for use as cropland and pasture. Residential use is mainly for landowner farmsteads and small concentrations in the villages of Tab, Stewart, and Pence.

The watershed lost population over the period 1960-1970. This is consistent with its remoteness from any large urban area and with the trend of farms increasing in size.

The Warren County Area Plan Commission has developed a land use plan for Warren County, Indiana. The Jordan Creek Watershed is zoned agricultural with the exception of three areas zoned I-2 (Heavy Industrial) and the three small towns. All structural works of improvement under the PL-566 program will be done in areas zoned as agricultural. The project proposals are not in conflict with any other proposal, and they enhance present land use.

V. ENVIRONMENTAL IMPACT

A. Conservation land treatment

The application of land treatment measures will bring an additional 27,517 acres under adequate treatment. Conservation practices to be applied to cropland are contour farming, grassed waterways, grade stabilization structures, conservation cropping systems, crop residue management, terraces, and minimum tillage. These practices will reduce erosion through interception of rainfall, reduction of runoff, and stabilization of drainageways. Reducing sheet erosion will permit inherent and applied fertility to be maintained. The use of conservation cropping systems, including minimum tillage will provide improved plant growth through improvement of soil characteristics. The combined effects of these practices will reduce the annual soil loss of the 8,400 acres of erosive cropland from 5.7 tons/acre to 2.5 tons/acre, which is within the 3.5 tons/acre annual soil loss tolerance. In addition to reducing soil losses, the application of soil and water conservation practices will promote the proper use of soil and water resources and will provide lower maintenance costs for the planned structural measures.

These conservation practices will reduce the sediment yield from the watershed from an estimated 12,000 tons annually (.33 tons per acre) to about 9,000 tons annually (.21 tons per acre).

Removal of surplus water through installation of subsurface drains, drainage field ditches, and drainage mains or laterals will enhance growth on 26,800 acres of cropland that have a wetness limitation. Reduced production costs, improved crop quality, and increased yields will increase the efficiency of the farm enterprise.

Pasture management practices to be applied on 150 acres will improve the overall quality and productivity of pastures. Soil erosion in pastures will be reduced from .22 tons/acre to .13 tons/acre. Such areas, when properly treated and managed, complement the overall farm operation and contribute significantly to farm income.

Forest land treatment measures to be applied to 15 acres will improve the overall hydrologic condition of the watershed. Creation of a good humus layer in these areas will reduce runoff and erosion. Approved cultural operations and livestock exclusion from forest land will improve the quality of future forest land production as well as increase the overall quality of production.

The average annual soil loss from the watershed will be reduced from an estimated 49,172 tons/year to 28,098 tons/year.

V. ENVIRONMENTAL IMPACT

A. Conservation land treatment - cont'd

Many species of wildlife will benefit from vegetative land treatment measures that contribute to the quality of wildlife habitat. Some of these measures are: grassed waterways, diversions, pasture and tree planting, critical area planting and protection from grazing.^{1/}

Some land use change is projected to occur during the life of this project; however, these changes are expected to result from changing economic and technological conditions rather than project action.

B. Structural measures

Greatest impact of planned channel improvement will be in relieving joint floodwater-drainage problems occurring throughout watershed Reaches A, B, C, D, E, and J. An estimated 15,920 acres in total will benefit from the project.

Benefits will accrue through the removal of surplus surface and subsurface water. Many existing tile drains, currently inoperative because of poor outlet conditions, will become operational. Farming operations delayed in the past because of water problems will be permitted to proceed on a timely basis. Yields will increase and production costs decrease. Opportunities to capitalize on the production advantages afforded by an increasing level of technology will be increased.

In addition, many areas of the watershed affected by joint floodwater drainage problems, but not dependent on the project for their solution, will benefit through a demonstration effect. Structural measures installed as a part of the project will clearly serve as impetus to these areas for installation of the most practical combination of needed on-farm drainage improvements.

Areas on which damage-reduction benefits were evaluated include the flood plain described under "Watershed Problems." Crop and pasture damages will be reduced by 40 percent, damage to roads and bridges 14 percent, and indirect damages 29 percent in these areas.

An estimated 130 agricultural landowners and several roads and bridges will be benefited. Benefits will accrue through increased agricultural

^{1/} Soil Conservation Service Biology Technical Note No. 6, Wildlife Response to Selected Conservation Practices.

V. ENVIRONMENTAL IMPACT

B. Structural measures - cont'd

production, reduced crop and pasture production costs, and lower maintenance expenses on flood plain improvement. Principal beneficial effects will result from reduced stages on the more frequent floods (floods expected to occur once every 5 years or less). A summary comparison of flooded areas with and without the project for the area in which damage-reduction benefits were evaluated in Indiana is presented below:

(Flood)	(Without Project)	(With Project)
100-year	1881 ac.	1774 ac.
5-year	1069 ac.	721 ac.
1-year	514 ac.	294 ac.

Protection from the 1-year cropping season flood will be afforded by the project on Reaches A, B, C, D, and J.

No increase in stages will occur on the Illinois portion of Jordan Creek downstream of the area in which flood reduction benefits were evaluated. A summary of flooded areas with and without the project in Illinois is presented below:

(Flood)	(Without Project)	(With Project)
100-year	478 ac.	476 ac.
5-year	376 ac.	364 ac.
1-year	300 ac.	300 ac.

The method of installation of structural measures is proposed so that the minimum possible wildlife habitat destruction will occur. About 22 acres of woody wildlife habitat will be destroyed during construction. The wildlife habitat losses will be mitigated by replanting trees and shrubs on the spoil area, securing a permanent easement on existing trees and shrubs as a "filter strip" on the unconstructed side of the channel. Based on recommendations of members of the fish and wildlife discipline, about 27 acres of trees and shrubs will be replanted. All disturbed areas within the permanent easement will be seeded with a grass and legume mixture to provide herbaceous cover for wildlife and to prevent erosion. The existing stream has some fishery value as a spawning stream up to the vicinity of Little Creek tributary. This value will not be disturbed by the installation of the project measures.

V. ENVIRONMENTAL IMPACT

B. Structural measures - cont'd

The proposed design of structural measures and method of construction will reduce soil erosion within the channel and provide for better bank stability. Sediment traps at selected intervals will reduce sediment movement downstream during construction activity.

C. Economic and social

During the period of construction, approximately 39 man-years of labor will be required for the installation. During the life of the project, about 8 man-years will be required annually for the operation and maintenance of structural and associated land treatment measures.

The quality of living for the beneficiaries of the project should be improved because of the benefits realized from the project. The average benefits for 130 farm units will be approximately \$3,820.

Secondary effects generated by the project will be through increased demands on local suppliers of goods and services and on local processing, transporting, and marketing facilities.

V. ENVIRONMENTAL IMPACT

D. Favorable environmental effects

The following project effects are considered favorable to the total environment:

1. Adequately treat 27,517 acres, 78% of the watershed lands, thus improving on all land uses.
2. Soil erosion will be controlled on 8,400 acres. This control will result in reduced delivery of sediment and soil fertility to streams and waterways, thereby reducing one source of water pollution.
3. Provide average annual joint flooding and drainage relief on nearly 15,920 acres and overbank flooding relief on 1,390 acres.
4. Provide wildlife habitat through: 1) installation of vegetative treatment measures, 2) management of 15 acres of forest land, 3) protection of woody habitat and idle land within the permanent easement on the unconstructed side, 4) planting of 56 acres of grasses and legumes, and 5) protection of vegetative cover and wildlife plantings in areas adjacent to the channel through livestock exclusion.
5. Improve the quality of life and increase demands on business within the area by economic benefits realized from the project.
6. Preserve known archaeological sites.
7. Improve fishery by removing sediment from stream channel.

V. ENVIRONMENTAL IMPACT

E. Adverse environmental effects

The following project effects are considered adverse:

1. Destruction of 22 acres of woody habitat as a result of channel work.
2. Damage to unconstructed side of channel during installation of grassed waterways, surface field ditches and grade stabilization structures.
3. Increase noise, air and water pollution (turbidity) during construction.

VI. ALTERNATIVES

1. Main channel and tributary improvements as proposed in the initial plan. This alternative would provide essentially the same drainage benefits as the planned project; flood benefits would be realized. There would be increased adverse environmental effects along main Jordan Creek downstream of the state line as a result of destruction of valuable woody habitat or fishery habitat. The installation costs would be \$2,017,000. This alternative was eliminated when Illinois sponsors were unable to assure land rights for induced damage areas downstream of the project.

2. Installation of subsurface drainage pump system. The estimated construction cost is \$1,047,800.

This alternative requires the installation of pumping stations where subsurface drainage is impaired. Basins would be constructed to serve as a collection point for the subsurface drain tiles. The pumps would then lift the water into existing drainageways. Discharge from pumps will be compatible with needed subsurface water removal.

Periodic flooding would continue along those drainageways identified in the current planned project. Installation of this alternative would require only minor channel excavation, thus nullifying most adverse affects on fish and wildlife resources. The average annual cost of this alternative would be \$242,880. Induced flooding would occur.

3. No PL-566 Project--no local action. The ongoing land treatment program will in time reduce sediment contribution to Jordan Creek and Little Creek; however, floodwater and drainage will continue to cause damages. The estimated net annual monetary benefits that would be foregone by not implementing the planned project are \$385,137.

Drainage and flooding relief have been a concern to the local people for nearly 30 years. It is likely they would attempt to obtain relief through minor channel work where determined feasible. However, the local people would not likely give so full consideration to environmental criteria as the planned PL-566 project.

4. Land treatment only. An accelerated land treatment program will reduce erosion and will thereby lessen sediment contribution to Jordan Creek and Little Creek. Properly selected and installed land treatment measures will slightly reduce runoff; however, the floodwater damages would remain nearly identical to present conditions. Drainage will remain unimproved and continue to cause damages as proper outlets would not be available. This alternative would have minimal adverse environmental effects on wildlife resources. The estimated net annual monetary benefits that would be foregone by not implementing the planned project are \$399,400.

VI. ALTERNATIVES

5. Land treatment and nonstructural measures. The land treatment part of this alternative would be the same as the land-treatment-only alternative. The nonstructural measures to reduce flooding would be the conversion of approximately 230 acres of cropland that is now flooded annually to a less intensive agricultural use.

This alternative would insignificantly reduce damages to agricultural land, and annual damages to county roads and bridges would continue. Minimal adverse environmental effects would result from this alternative.

VII. SHORT-TERM VS. LONG-TERM USE OF RESOURCES

Land use is expected to remain reasonably stable with only minor decreases in pasture and cropland and corresponding increases in other land. The entire watershed is agriculturally oriented, being 94.5 percent cropland. The area is best suited for cropland, pasture and woodland. The Chalmers, Raub, and Darroch soils are predominant and are the most productive in the county. The project will make possible the most efficient use of this valuable resource. The project is considered compatible with these trends.

The project will solve the majority of erosion, sedimentation, and drainage problems within the Indiana portion of the watershed. With the specified operation and maintenance program, it will function over its designed project life or longer.

The project will reduce options for long-term use of the 194 acres to be included within the permanent easement area along the channel. This area will contain 13 acres of forest land, 69 acres of cropland, 43 acres of grassland, and 69 acres of other land. 1/

Within the Wabash Subregion, the status of watershed activity is as follows: construction - 2; authorized for construction - 13; authorized for planning - 7; applications received and awaiting further action - 24.

The watersheds completed and authorized for construction represent 1,212 square miles or 5.8 percent of the Wabash Subregion.

Jordan Creek Watershed is identified as an early action project by the Wabash Comprehensive Study. 2/ The watershed has an area of 119.3 square miles which comprises 0.37 percent of the Wabash Basin. Therefore, any effect it would have on the subregion is considered negligible.

Cumulative environmental effects within the watershed will include the improvement of the quality of wildlife habitat through installation of land treatment.

1/ Other land includes - channel and side slopes and areas providing wildlife habitat adjacent to the channel.

2/ Wabash River Basin Comprehensive Study, Vol. 1, Main Report, June, 1971.

VIII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The average annual capital funds required for the project are \$169,888 including associated costs. This includes costs for land and labor.

The energy expended for project installation is irretrievable.

Land usage within the project permanent easement area before and after project follows: (Main Jordan Creek and laterals)

<u>Land Use</u>	<u>Present</u>	<u>Future</u>
Cropland	69 ac.	-- ac.
Forest land	13 ac.	15 ac.
Grassland <u>1/</u>	43 ac.	73 ac.
Other land	69 ac.	106 ac.

These conversions are considered to be committed for the project life.

1/ Other land includes - channel bottom and side slopes and areas providing wildlife habitat adjacent to the channel.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

A. General

Relief from standing water and the need for improved drainage has long been recognized as a need for the Jordan Creek Watershed. Action to provide relief for the Indiana portion of the watershed was initiated in the mid-forties. Records indicate that the Soil Conservation Service was contacted at that time to study the needs and provide a solution for the problems of water management.

An application for planning assistance under PL-566 for the Indiana portion was submitted in 1959. This application was not approved by the SCS since there were no provisions to include the Illinois portion for overall formulation.

An amended application was prepared in 1964 that included the entire drainage area of the watershed. This application was approved by the Illinois Department of Agriculture and the Indiana Department of Natural Resources. Subsequent approval was given by the SCS in August 1964.

A preliminary investigation report was completed in September 1967. The report emphasized work on channels. Work was considered for about 10.5 miles of main Jordan to within about 2 miles of its junction with Middle Branch. Also considered was about 2.4 miles of Little Creek and 3.9 miles of Leak Ditch in Indiana and 7.7 miles for Middle Branch, mostly in Illinois.

To carry out the general formulation of the preliminary investigation report, the Jordan Creek Conservancy District in Indiana was organized in February 1969. An effort to form a similar organization in Illinois failed through referendum vote.

The watershed was authorized for planning by the SCS in April 1969.

The planning effort resulted in a draft work plan in June 1972. The plan formulation for this document was the result of several factors that were encountered during plan development.

First, there was a need for a proper sponsor in Illinois to carry out any works of improvement that were necessary in that state for overall watershed development. It was finally agreed that the Pleasant Hill Drainage District would provide the necessary sponsorship for the main Jordan Creek work and a small amount of lateral work that would be done in Illinois.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

A. General - cont'd

Final formulation for the 1972 draft work plan consisted of 43.0 miles of open channel improvement; 585 miles of surface drains and grassed waterways; and 20.5 miles of tile drains with some surface drains and grassed waterways. The work on the main channel extended down to the Chicago and Eastern Illinois Railroad about five miles east-southeast of Rossville, Illinois. Most of the benefits accrued to the Indiana portion of the watershed resulting from the installation of the upstream measures. The general design of the planned water management features emphasized a fairly fast excess water removal rate.

The planned project caused greater induced flows along the lower reaches of the main channel, especially for the infrequent, high volume rainfall events. The Pleasant Hill Drainage District attempted but was not able to obtain required flowage easements below the project cutoff where induced flows were estimated to occur.

A meeting was held at Williamsport on January 17, 1974. Inability to obtain the required easements was discussed. The sponsors requested the SCS to study alternatives to the June 1972 draft that could eliminate the problem caused by the land rights situation.

On September 11, 1974, a meeting was held at Pence, Indiana, with local people and SCS personnel from both states in attendance. A project alternative was discussed whereby most of the main channel work would be eliminated from a point about 3 miles upstream of the state line and proceeding downstream to the cutoff of the June 1972 draft at the Chicago and Eastern Illinois Railroad. Remaining channel work would be reduced in size to diminish the rapid water removal rate that was previously planned. In addition, the land treatment program would receive greater emphasis for those practices that would reduce surface runoff.

On January 15, 1975, a public information meeting was held at Pence, Indiana. The Draft Work Plan and the Environmental Impact Statement were thoroughly presented to those present. General discussion was held after the presentation.

In February 1975, both sponsors in Illinois--the Vermilion County Soil and Water Conservation District and the Pleasant Hill Drainage District--requested to withdraw from the proposed project.

The Work Plan includes only those measures proposed within the State of Indiana.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

A. General - cont'd

During the review stage for the first draft to the work plan and environmental impact statement, the following groups or agencies were asked to review and comment on the documents:

Illinois

State Geological Survey
Bureau of Soil & Water Conservation
Division of Waterways, Illinois Department of Transportation
USDI, Bureau of Outdoor Recreation, Regional Director
Department of Business & Economic Development, Director
Farmers Home Administration, State Director
Illinois State ASCS Office
Extension Service, Director
Association of Illinois Soil and Water Conservation Districts
Department of Conservation, Division of Fisheries
Division of Wildlife Resources
Division of Forestry
State Department of Mines & Minerals, Director
State Water Survey, Chief
U.S. Fish and Wildlife Service, Regional Director
Extension Service, Prof. Robert D. Walker
Governor of Illinois
National Park Service, Mid-Atlantic Regional Office
Environmental Protection Agency, Water Quality Office
Division of Highways, Illinois Department of Transportation
State Long-Range Planning Division
Department of Public Health
Illinois Archaeological Survey
Department of Transportation, Secretary
Pollution Control Board
Department of Local Government Affairs
State Clearinghouse Coordinator
Illinois Environmental Protection Agency
Department of Housing & Urban Development
National Audubon Society
Illinois Nature Preserves Commission
Department of Commerce, Environmental Affairs
Governor's Task Force, Office of Flood Control
Ohio River Basin Commission, Chairman

Indiana

Amos W. Butler Audubon Society
Izaak Walton League
Indiana Conservation Council, Inc.
Indiana Department of Natural Resources

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

A. General - cont'd

Cooperative Extension Service, Purdue University
Fish and Wildlife Service
District Engineer, Army Corps of Engineers
Indiana Farm Bureau, Inc., Natural Resources Department
Environmental Protection Agency
Warren County Soil & Water Conservation District
Jordan Creek Conservancy District
Glenn A. Black Laboratory of Archaeology
Indiana Historical Society
Warren County Commissioners
USDA, Office of the General Counsel
USDA, Farmers Home Administration
USDA, Agricultural Stabilization and Conservation Service
Ohio River Basin Commission
U.S. Geological Survey
State Soil and Water Conservation Committee
Bureau of Mines
Indiana Association of Soil and Water Conservation Districts
Indiana Clearinghouse Review Office
Indiana Stream Pollution Control Board
USDA, Economic Research Service
National Marine Fisheries Service
Natural Resources Department, Ball State University

A public information meeting was held on January 15, 1975, in Pence, Indiana, to explain the work plan and environmental statement. No significant objections or environmental issues were raised.

B. Discussion and disposition of each comment on draft environmental statement

Comments were requested from the following agencies, groups, and individuals:

Ohio River Basin Commission
Department of the Army
Department of Commerce*
Department of Health, Education and Welfare
Department of the Interior
Department of Transportation
Environmental Protection Agency
Federal Power Commission*
Office of Equal Opportunity, USDA*
Advisory Council on Historic Preservation
Indiana Department of Natural Resources (for Governor)
Indiana State Clearinghouse
Water Resources Council*

*Did not respond.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

B. Discussion and disposition of each comment on draft environmental statement - cont'd

Indiana State Historic Preservation Officer^{1/}
Environmental Impact Assessment Project*
Natural Resources Defense Council*
Indiana Historical Society*
Environmental Defense Council*
National Wildlife Federation*
National Audubon Society*
Friends of the Earth*

*Did not respond.

SUMMARY OF COMMENTS AND RESPONSES

Each issue, problem, or objection is summarized; and a response given on the following pages. Comments are serially numbered. The original letters of comment appear in Appendix D.

U.S. Department of the Interior

- 1) Comment: We believe the construction of artificial pools and riffles should be provided in that section of the Jordan Creek below the junction of Leak Ditch, which is proposed for channel improvement.

Response: Only one pool exists in this section of the stream. That particular pool is located at the bridge crossing below the junction of Jordan Creek and Leak Ditch. The existing pool will be replaced with a pool having similar dimensions. Artificial riffles will not be provided because the existing pool was created by water turbulence at the bridge opening, rather than natural riffles. This water turbulence is expected to continue, maintaining the created pools.

- 2) Comment: The multi-agency biology team recommended that the 10 foot mitigation planting strip be increased to 15 feet in the lower section of the watershed where channel dimensions are to be made wider.

Response: The width of the planting strip did not increase in the lower reach due to less channel excavation than previously

^{1/} The Director of IDNR is designated as the State Historic Preservation Officer. Comments from him are considered as encompassing both responsibilities.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

B. Discussion and disposition of each comment on draft environmental statement - cont'd

anticipated. The amount of excavation directly affects the cross-section dimensions, including the planting strip width. However, a 10 foot strip of trees and shrubs will be planted along the entire length of Jordan Creek, Little Jordan Creek, Leak Ditch and all other tributaries included in the structural measures. The proposed mitigation is more than that required to meet the planting acreage recommended by the multi-agency biology team.

- 3) Comment: The multi-agency biology team recommended that mitigation consist of Japonica lespedeza, autumn-olive, and dogwood in the lower reach and a row each of autumn-olive and dogwood in the upper reaches. It was also recommended that the area be seeded with native prairie grass (big bluestem and switchgrass) rather than the commonly used mixture of grasses and legumes.

Response: Specific species of trees, shrubs, and grasses are not listed in the impact statement or operation and maintenance agreement because of the uncertainty of their availability from year to year. It should also be noted that new and improved species may be released from year to year. However, the multi-agency team will be provided an opportunity to recommend species for planting in the design stage.

SEE: Project Installation, Structural Measures for participation during design stage.

- 4) Comment: We recommend that the gravel blankets consist in part, of the larger size stones (greater than 2 inches) to stabilize the aquatic habitat.

Response: The use of larger stones in armor plating material would require much greater thickness thus increasing the volume needed. Addition of some larger stones would mean that standard stone gradations could not be used, thus greatly increasing the per unit cost. To maintain the necessary capacity would require additional earth excavation with associated loss of stream habitat.

- 5) Comment: The maintenance travelway often becomes rutted, and vegetation in these areas is damaged or destroyed by vehicles used in the maintenance inspection. This lessens the value of the area for wildlife and could create erosion problems. We recommend that the maintenance agreement require protection of this vegetation.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

B. Discussion and disposition of each comment on draft environmental statement - cont'd

Response: Maintenance inspections are scheduled annually but may also be conducted following unusual storms. It is very unlikely that maintenance inspection traffic would be detrimental to the vegetation. However, the operation and maintenance agreement does include provisions for maintaining adequate vegetation. If the area is significantly damaged, it will be re-vegetated.

- 6) Comment: Spraying of herbicides on channel banks to control vegetation can be very detrimental to fish and wildlife. Mowing and hand cutting of woody vegetation, stacking this brush in piles on the spoil banks would be a more desirable practice from a fish and wildlife standpoint. We would like to see the maintenance agreement accommodate these concerns.

Response: The conservancy district has the opportunity to use all legal chemicals available in conducting the operation and maintenance program. The Soil Conservation Service has no authority to restrict the use of modern weed control technology. However, the method of mowing and hand cutting woody vegetation will be recommended to the conservancy district for their consideration.

- 7) Comment: The establishment period for vegetation restoration may not be long enough. We believe the wildlife plantings should be established and the timespan should be that which is necessary to establish the vegetation.

Response: Public Law-566 funds will be available for re-establishing vegetation, if necessary, up to 3 years following completion of the project. Beyond the 3-year installation period (outlined in the operation and maintenance agreement), the conservancy district will be expected to maintain or re-establish vegetation.

- 8) Comment: It is suggested that the full scope of the proposed work be summarized on the summary sheet of the environmental statement.

Response: Concur. A more detailed summary has been provided.

- 9) Comment: Land Treatment. It is unclear how much of the 27,517 acres to be treated by the end of the installation period is already treated, and how much is directly attributable to the proposed project.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

B. Discussion and disposition of each comment on draft environmental statement

Response: Concur. Appropriate sections have been clarified.

- 10) Comment: The environmental impact statement mentions the U.S. Geological Survey as referring to "future levels" of insecticide concentration when it should state that "present levels of concentration" are not considered alarming. In actuality, we have no idea what "the future" concentrations will be.

Response: The sentence has been changed to read as follows:
Future levels of concentrations are not expected to be alarming.

- 11) Comment: Archaeological, Historical, and Unique Scenic Resources.
The word National in the second line of the opening paragraph should be Natural to conform to footnote 3.

Response: Concur. Correction has been made.

- 12) Comment: The State Historic Preservation Officer should be consulted with regard to any property within the project area which may be eligible for inclusion in the National Register of Historic Places.

Response: Concur. The State Historic Preservation Officer has been contacted, and the appropriate letter has been added to the environmental impact statement.

- 13) Comment: The extent of the archaeological "study" conducted by the Indiana Historical Society is unclear. In the event that it was not a complete archaeological reconnaissance survey the Society should be consulted with regard to the need for such a survey.

Response: The Soil Conservation Service engaged in an archaeological survey with the Indiana Historical Society. Glenn A. Black Laboratory of Archaeology, through the historical society, completed an archaeological reconnaissance and report in May 1975.

The Indiana Historical Society, Glenn A. Black Laboratory of Archaeology, and the National Advisory Council on Historic Preservation have reviewed and commented on the draft documents. No comments were made recommending a need for further studies.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

B. Discussion and disposition of each comment on draft environmental statement - cont'd

- 14) Comment: We suggest that the final environmental statement not contain any map such as Exhibit 10 in Appendix A that might expose valuable cultural resources to vandalism.

Response: Concur. Exhibit 10 has been corrected to omit archaeological sites.

- 15) Comment: Adverse Environmental Effects--"Change of 290 acres of grassland and 5 acres of idle land used as wildlife habitat," needs further explanation.

Response: Concur. The acreages used were incorrect. Adverse environmental effect is no longer valid, and statement has been deleted.

- 16) Comment: Short-Term Vs. Long-Term Use of Resources--It is stated that current land use in the proposed permanent easement includes 48 acres of forest land, yet in the description of the project area only 25 acres of forest land are listed for the entire watershed.

Response: The 48 acres of forest land was incorrect. Appropriate changes have been made.

Environmental Protection Agency

- 1) Comment: The subsurface drains that are designed to remove water from ponded areas will also increase the nutrient loading and thus algae growth within the Jordan Creek Watershed. This extent of this impact should be discussed.

Response: According to recent research, both nitrogen and phosphorus are limiting elements to algae growth.^{1/} Because of its low solubility, phosphorus added to lands as fertilizer remains near the point of application. It moves to streams and lakes by adhering to sediment and other particulate material. Very little phosphorus gets into a subsurface drainage system. Nitrogen will filter down into a subsurface drainage system and will also be carried overland by surface water runoff. The installation of subsurface drainage allows rainwater to enter the soil instead of flowing over the surface and carrying soil particles with phosphorus and nitrogen into the stream.

^{1/} Eutrophication: A Bimonthly Summary of Current Literature, Issue No. 44, (1975 Willow Drive, Madison, Wisconsin, Sept.-Oct. 1974) page 21.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

B. Discussion and disposition of each comment on draft environmental statement - cont'd

The area where the subsurface drainage will be installed is already in cropland where fertilizer is being applied. We feel that the nitrogen level in the streams is already high enough for algae growth and that the concentration of phosphorus is the limiting factor. The amount of phosphorus reaching the stream should be reduced through subsurface drainage.

- 2) Comment: With regard to structural measures, the number of sediment traps and the length of the selected intervals to reduce sediment movement downstream should be given. If this information cannot be determined at this time, the Final EIS should provide a description of the guidelines that will be used to determine when and where sediment traps will be constructed.

Response: Concur. The following information was added to the Environmental Impact Statement, "As a minimum, at least one trap will be used per mile of channel constructed. The minimum size of the sediment trap will be 100 feet long and 3 feet deep (below channel bottom grade)."

Advisory Council on Historic Preservation

- 1) Comment: The Council requests that it be furnished by the Soil Conservation Service (SCS) with an indication as to whether or not there are historical sites in the project area which may be eligible for inclusion in the National Register of Historic Places.

Response: The Indiana State Historic Preservation Officer was contacted concerning eligibility of historical sites for inclusion in the National Register of Historic Places. He concurred that there were no known sites eligible for inclusion.

- 2) Comment: The Council requests that it be furnished by SCS with a determination as to whether or not the fifteen archaeological sites identified by the Indiana Historical Society in its archaeological survey of the project area are eligible for inclusion in the National Register of Historic Places.

Response: The Indiana Historical Society stated in their archaeology report that there were no known sites eligible for inclusion.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

B. Discussion and disposition of each comment on draft environmental statement - cont'd

- 3) Comment: The Council suggests that a copy of the Indiana SHPO's response be included in the final environmental statement.

Response: Concur. A copy of the response will be included in the final statement.

X. LIST OF APPENDIXES

APPENDIX A - EXHIBITS

<u>Exhibit No.</u>	<u>Description</u>
1	DEFINITION OF CONSERVATION PRACTICES AND LAND USE
2	ILLUSTRATIONS OF CONSERVATION PRACTICES
3	ILLUSTRATION OF ONE-SIDED CHANNEL WORK
4	TYPICAL CHANNEL CROSS-SECTION
5	CHANNEL PROTECTION MEASURES
6	CHANNEL PROFILES
7A	ESTIMATED SOIL LIMITATIONS OR SUITABILITY FOR SELECTED USES
7B	KEY TO EXHIBITS 7A AND 7C
7C	GENERAL SOIL MAP
7D	DESCRIPTION OF SOIL ASSOCIATIONS ON THE GENERAL SOIL MAP
8	SURFICIAL GEOLOGY MAP
9	POTENTIAL BIRDS AND MAMMALS
10	WATER QUALITY SAMPLING STATIONS
11	WATER QUALITY ANALYSES
12	STRUCTURE DATA - CHANNELS

APPENDIX B - PROJECT MAP

APPENDIX C - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

APPENDIX D - LETTERS OF COMMENT RECEIVED ON THE DRAFT ENVIRONMENTAL
IMPACT STATEMENT

XI.

Approved by: _____



Cletus J. Gillman
State Conservationist

Date: October 28, 1975

APPENDIX A - EXHIBIT

<u>Exhibit No.</u>	<u>Description</u>
1	DEFINITION OF CONSERVATION PRACTICES AND LAND USE
2	ILLUSTRATIONS OF CONSERVATION PRACTICES
3	ILLUSTRATION OF ONE-SIDED CHANNEL WORK
4	TYPICAL CHANNEL CROSS-SECTION
5	CHANNEL PROTECTION MEASURES
6	CHANNEL PROFILES
7A.	KEY TO EXHIBITS 7B AND 7C
7B.	ESTIMATED SOIL LIMITATIONS OR SUITABILITY FOR SELECTED USES
7C.	GENERAL SOIL MAP
7D.	DESCRIPTION OF SOIL ASSOCIATIONS ON THE GENERAL SOIL MAP
8	SURFICIAL GEOLOGY MAP
9	POTENTIAL BIRDS AND MAMMALS
10	WATER QUALITY SAMPLING STATIONS
11	WATER QUALITY ANALYSES
12	STRUCTURE DATA - CHANNELS

DEFINITION OF CONSERVATION PRACTICES AND LAND USE

CONSERVATION PRACTICES

CONSERVATION CROPPING SYSTEM

Growing crops in combination with needed cultural and management measures. Cropping systems include rotations that contain grasses and legumes as well as rotations in which the desired benefits are achieved without the use of such crops.

CONTOUR FARMING

Farming sloping cultivated land in such a way that plowing, preparing and planting, and cultivation are done on the contour. (This includes following established grades of terraces, diversions or contour strips.)

CROP RESIDUE USE

Using plant residues to protect cultivated fields during critical erosion periods.

CRITICAL AREA PLANTING

Stabilizing silt-producing and severely eroded areas by establishing vegetative cover. This includes woody plants, such as trees, shrubs or vines, and adapted grasses or legumes established by seeding or sodding to provide long-term ground cover. (Does not include Tree Planting mainly for the production of wood products.)

DIVERSION

A channel with a supporting ridge on the lower side constructed across the slope.

DRAINAGE FIELD DITCHES

A shallow graded ditch for collecting water within field, usually constructed with flat side slopes for ease of crossing. (This does not include drainage main or lateral, or grassed waterway or outlet.)

DRAINAGE MAIN OR LATERAL

An open drainage ditch constructed to a designed size and grade. Does not include drainage field ditch.

DEFINITION OF CONSERVATION PRACTICES AND LAND USE

CONSERVATION PRACTICES - CONT'D

GRADE STABILIZATION STRUCTURE

A structure to stabilize the grade or to control head cutting in natural or artificial channels. (Does not include structures used in drainage and irrigation systems primarily for water control.)

GRASSED WATERWAY OR OUTLET

A natural or constructed waterway or outlet shaped or graded and established in vegetation suitable to safely dispose runoff from a field, diversion, terrace, or other structure.

MINIMUM TILLAGE

Limiting the number of cultural operations to those that are properly timed and essential to produce a crop and prevent soil damage.

OPEN CHANNEL

Constructing or improving a channel, either natural or artificial, in which water flows with a free surface.

PASTURE AND HAYLAND MANAGEMENT

Proper treatment and use of pastureland or hayland.

PASTURE AND HAYLAND PLANTING

Establishing and re-establishing long-term stands of adapted species of perennial, biennial or reseeding forage plants. (Includes pasture and hayland renovation. Does not include grassed waterway or outlet on cropland.)

POND

A water impoundment made by constructing a dam or embankment, or by excavating a pit or "dugout".

SUBSURFACE DRAIN

A conduit, such as tile, pipe, or tubing, installed beneath the ground surface and which collects and/or conveys drainage water.

EXHIBIT 1

DEFINITION OF CONSERVATION PRACTICES AND LAND USE

CONSERVATION PRACTICES - CONT'D

TERRACE

An earth embankment or a ridge and channel constructed across the slope at a suitable spacing and with an acceptable grade.

TREE PLANTING

Planting tree seedlings or cuttings.

WILDLIFE UPLAND HABITAT MANAGEMENT

Retaining, creating or managing wildlife habitat other than wetland.

LAND USE

CROPLAND

Cropland includes all cultivated land used for field crops or hay in pasture or rotation; cropland temporarily idle or diverted from production under government programs; permanent hayland, orchards, vineyards and bush fruits; and open land from cropped and not converted to another use.

FOREST OR WOODLAND

Forest or woodland includes land that is at least 10% stocked with forest trees and capable of producing forest products or influencing a water regime, land that formerly grew trees and is not currently developed for non-forest use, and land that has been planted to trees.

OTHER LAND

Other land is non-federal rural land which is not classified as cropland, pasture or forest land. It includes strip mines, borrow and gravel pits, farmsteads, farm roads, ditches, rural non-farm residences, and idle, open rural non-farm land.

PASTURE

Pasture includes lands producing forage plants, principally introduced species, primarily for grazing and not included in cropland rotation; includes native pasture and may contain shade or timber trees if canopy is less than 10%.

(Reproduced from SCS Technical Guide Section IV and
Indiana Soil and Water Conservation Inventory 1968)

EXHIBIT 2



SOIL LOSS CAN BE
CONTROLLED...

WITH

MINIMUM TILLAGE...



AND/OR



CONTOUR FARMING.

POOR DRAINAGE CAN
BE CORRECTED...



BY



INSTALLING A
TILE SYSTEM...

AND/OR

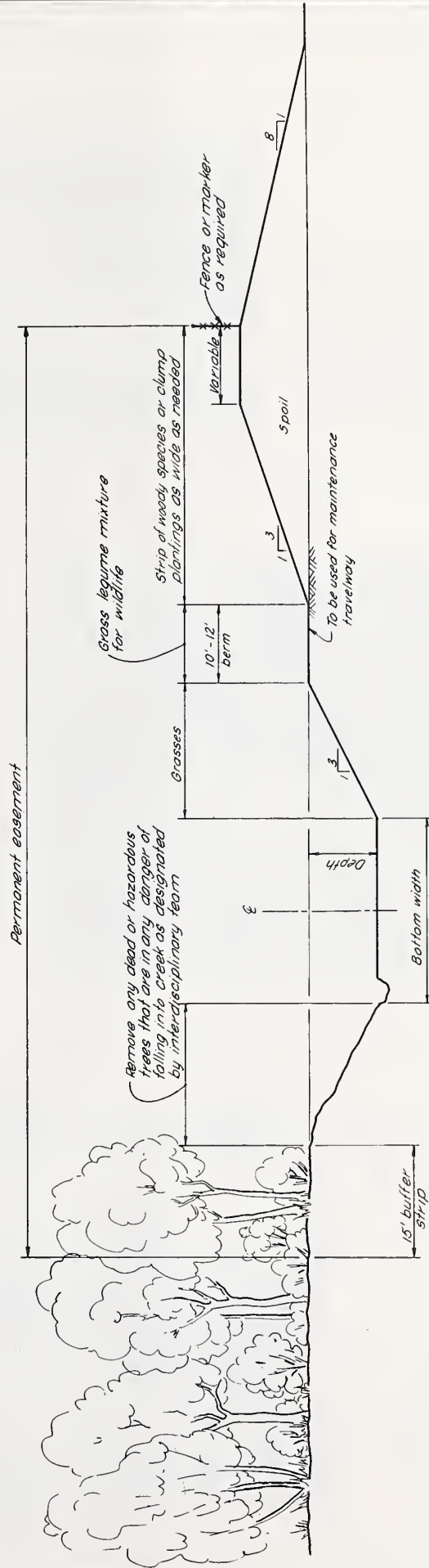
SURFACE DRAINAGE .



EXHIBIT 3



Channel work from one side only preserves valuable wildlife habitat.



TYPICAL CHANNEL CROSS SECTION
(with berm)

EXHIBIT 5

GRASSED WATERWAYS
PROVIDE ADEQUATE
PROTECTION FROM
EROSION ON GENTLY
SLOPING LAND ...



BUT



EROSION CONTROL STRUC-
TURES ARE NEEDED TO
PROTECT THE SOIL FROM
EROSIVE TURBULENCE OF
WATER DROPPING FROM
FIELD LEVEL INTO A ROAD
CULVERT ...

OR

WATER DROPPING FROM
FIELD LEVEL INTO AN
OPEN OUTLET DITCH.



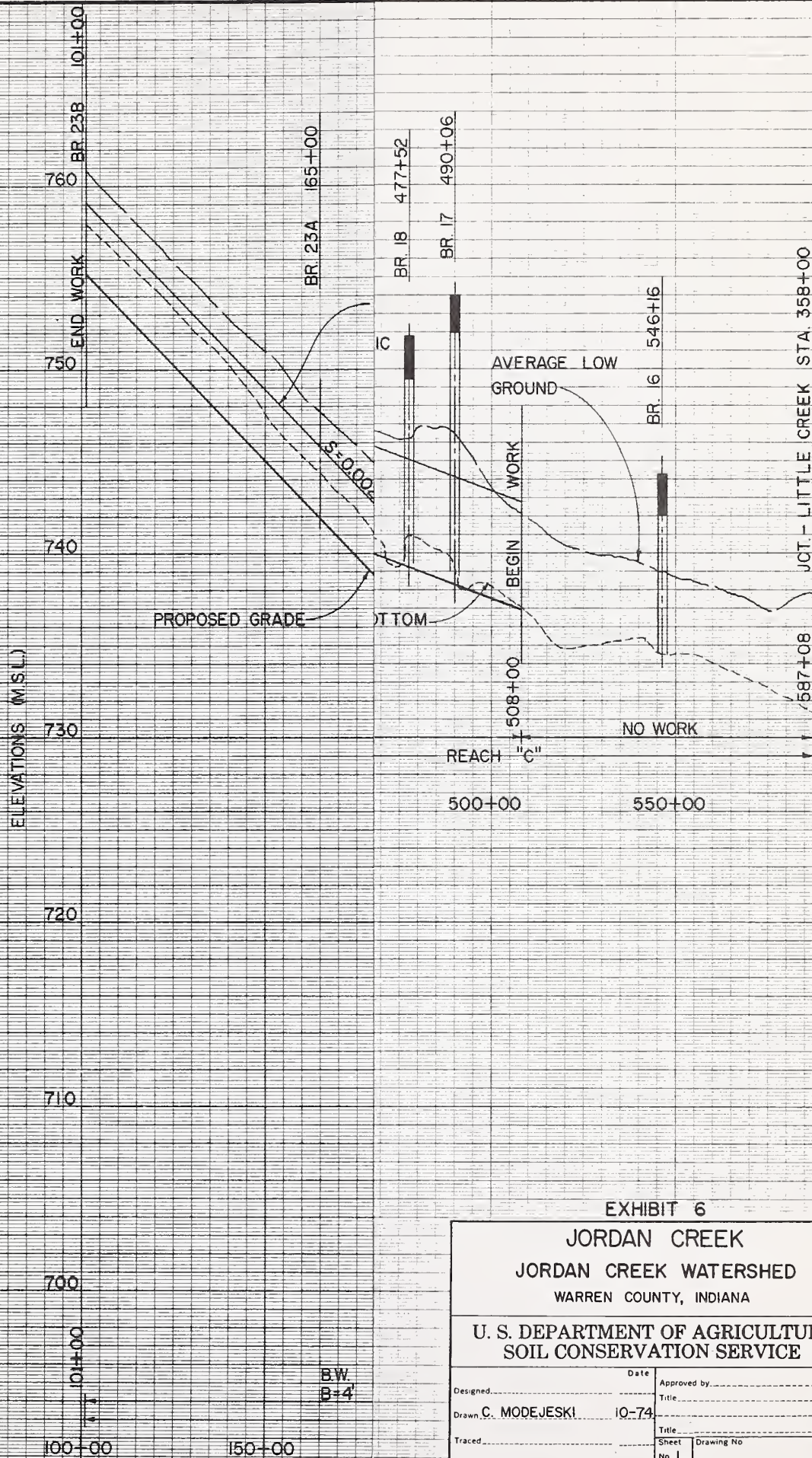


EXHIBIT 6

JORDAN CREEK JORDAN CREEK WATERSHED WARREN COUNTY, INDIANA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed.....	Date.....	Approved by.....
Drawn C. MODEJESKI	10-74	Title.....
Traced.....	Sheet.....	Drawing No.....
Checked.....	No. 1	of 3

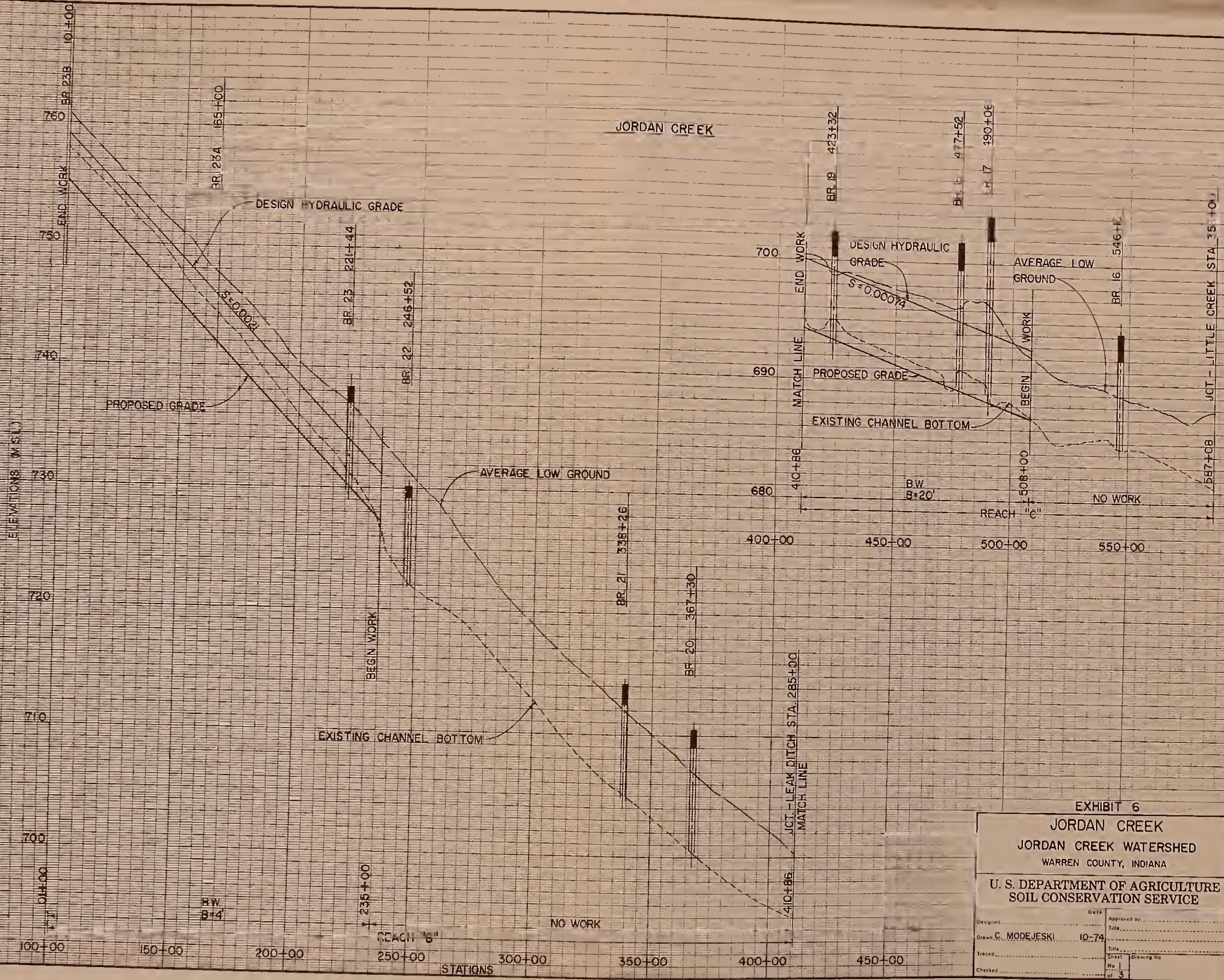


EXHIBIT 6
 JORDAN CREEK
 JORDAN CREEK WATERSHED
 WARREN COUNTY, INDIANA
 U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

Designed.....	Date.....	Approved by.....
Drawn C. MODEJESKI	10-74	Title.....
Traced.....		Title.....
Checked.....		Sheet.....
		Drawing No.....
		No. 1 of 3

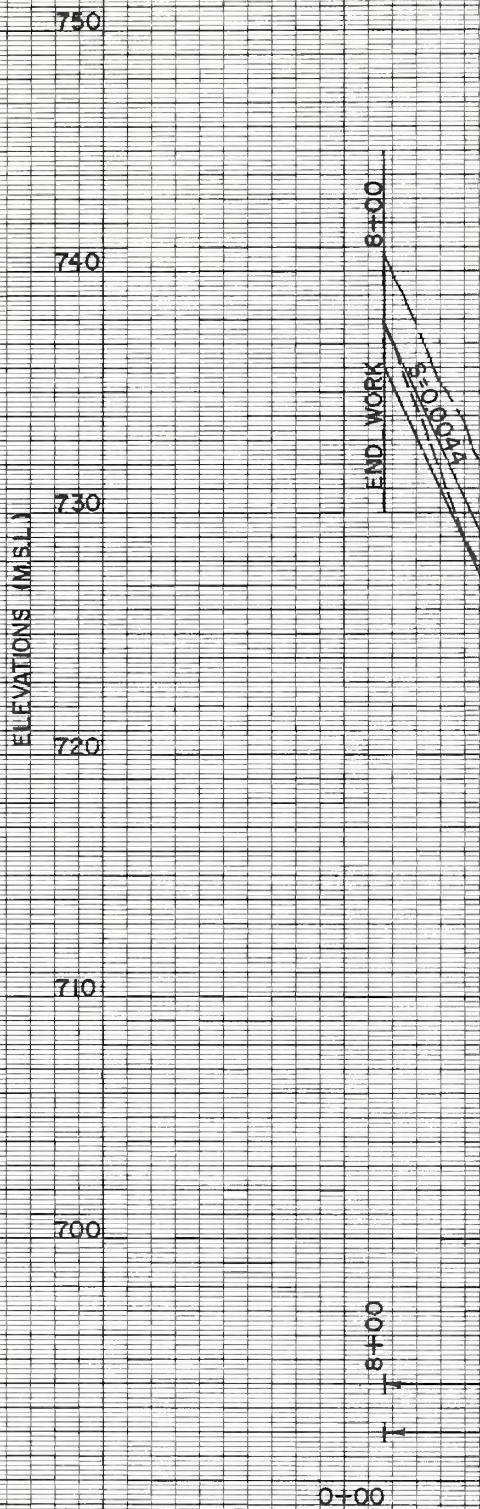


EXHIBIT 6

LEAK DITCH

JORDAN CREEK WATERSHED

WARREN COUNTY, INDIANA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed.....	Date.....	Approved by.....
Drawn C. MODEJESKI	10-74	Title.....
Traced.....		Title.....
Checked.....		Sheet No. 2 of 3

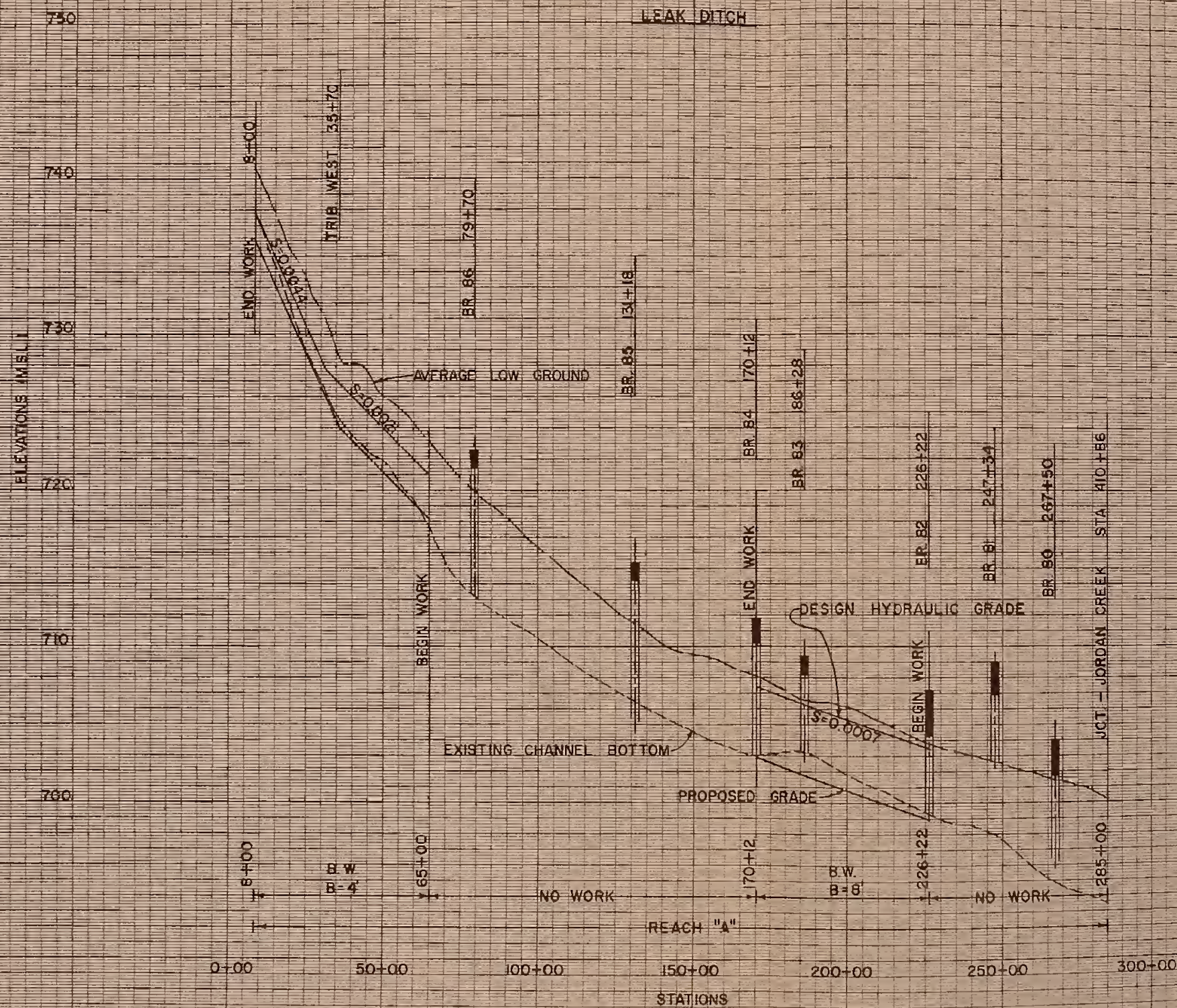


EXHIBIT 6

LEAK DITCH

JORDAN CREEK WATERSHED
WARREN COUNTY, INDIANA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed.....	Date.....	Approved by.....
Drawn.....	Title.....	
Traced.....	Sheet No. 2	Drawing No. 3
Checked.....	of 3	



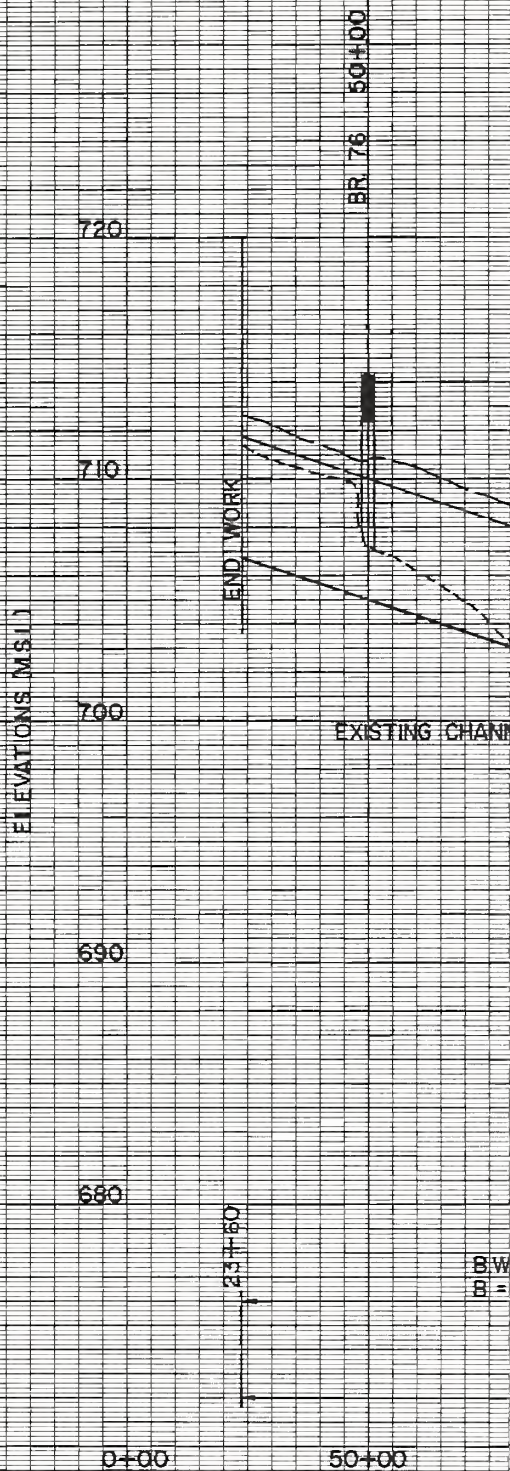


EXHIBIT 6

LITTLE CREEK
JORDAN CREEK WATERSHED
WARREN COUNTY, INDIANA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed.....	Date.....	Approved by.....
Drawn C. MODEJESKI	10-74	Title.....
Traced.....		Title.....
Checked.....		Sheet 3 Drawing No of 3



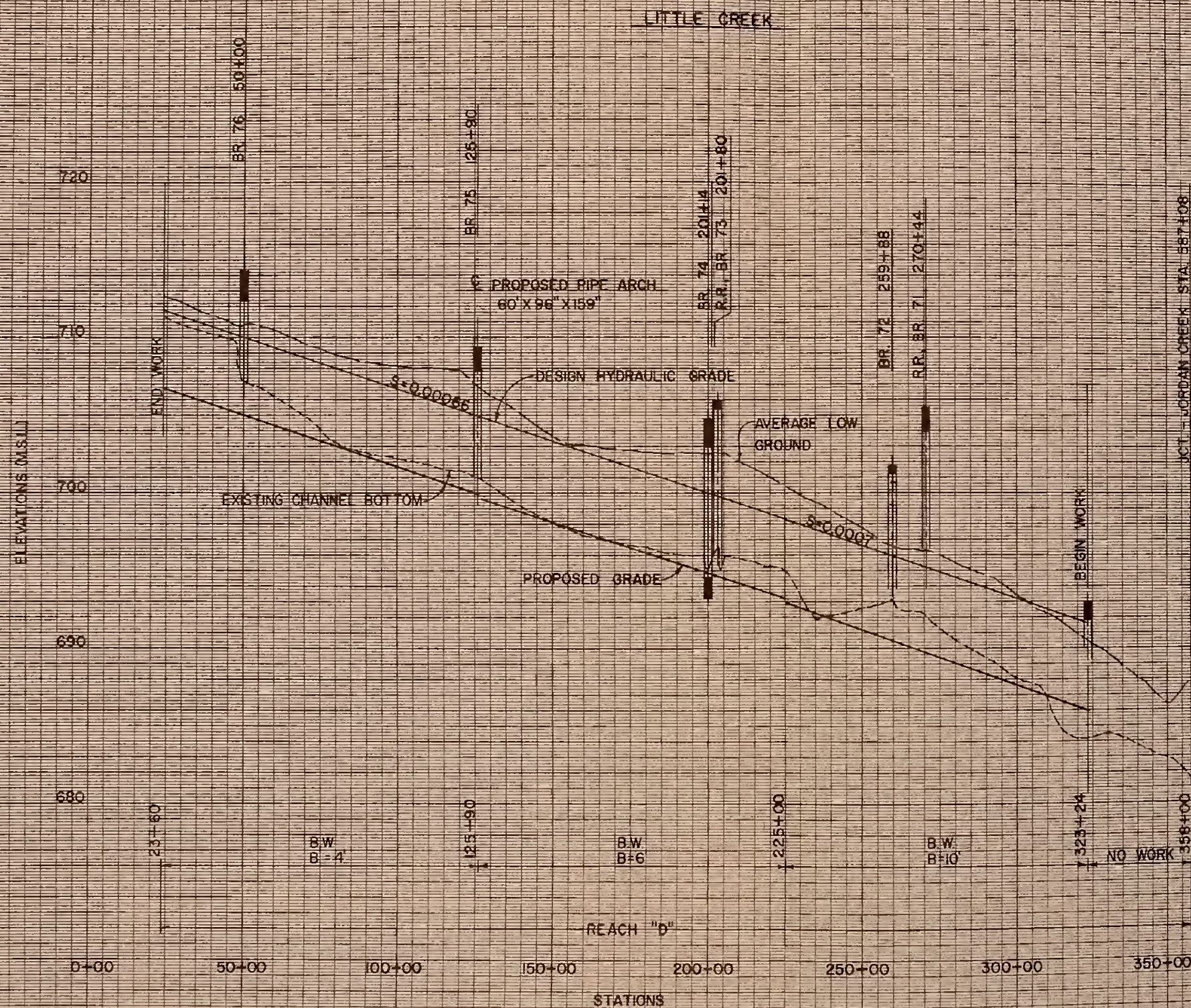


EXHIBIT 6

LITTLE CREEK
JORDAN CREEK WATERSHED
WARREN COUNTY, INDIANA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed.....	Date.....	Approved by.....
Drawn C. MODEJESKI	10-74	Title.....
Traced.....	Sheet No. 3	Drawing No.
Checked.....	of 3	

GENERAL SOIL INFORMATION

The General Soil Map (Exhibit 7C) of the Jordan Creek Watershed shows two main patterns of soils called soil associations. Each association contains a few major soils and several minor soils, and is named for the major soils. The soils in one association may be in another, but in a different pattern.

The General Soil Map is useful to people who want a general idea of the soils, who want to compare different parts of the watershed or who want to know the location of large tracts that are suitable for a certain kind of farm or non-farm land use. Such a map is not suitable for planning the management of a farm or field, or for selecting the exact location of a road, building or similar structure because the soils in any one association ordinarily differ in slope, depth, drainage, or other characteristics that affect management.

Detailed soil maps and information on soils and specific uses is available for much of the area encompassed by the watershed for this detailed information, please contact the field office of the Soil Conservation Service in Warren County.

SOIL INTERPRETATIONS

The interpretive table (Exhibit 7B) provides soil interpretations for 12 specific uses for each of the two soil associations shown on the General Soil Map of the Jordan Creek Watershed. The approximate percent of the association of each major soil and the total percent of all of the minor soils is given. Estimated limitations or suitability for each of the named soils for each of the 12 uses is given in terms of slight, moderate, or severe limitations or good, fair, poor or unsuited suitability. Beside each of the ratings the limiting soil properties or features are given by listing one or more numbers. These numbers correspond with those listed in the "Key to Principal Soil Limitations", at the bottom of the table. Soils rated as slight are estimated to have no principal soil limitations and are not referenced to the key.

SOIL LIMITATION CLASSES

Soils rated as "slight" have few or no limitations for the use. Soils rated as "moderate" have limitations which reduce to some degree their desirability when used for the purpose being considered. They require some corrective measures. Soils rated as "severe" have unfavorable soil characteristics that severely restrict their use and desirability for the purpose. A severe rating does not mean the soil cannot be used for a specific use. It does indicate problems during or after application of the use, unless special design, engineering or other corrective measures are used to overcome the limitations. Costs are usually greater than on soils rated slight or moderate, and many times costs are prohibitive.

SOIL SUITABILITY RATING

"Good", "fair", "poor" and "unsuited" are terms used to rate soils as a source of sand, gravel and roadfill. Soils rated as "good" have qualities such that they can be considered as a suitable resource material. Soils rated "fair" have some problems in the material that make them less desirable. Soils rated as "poor" have problems that greatly limit their suitability as a source. Soils rated as "unsuited" are physically unfit, or it is not practical to process the material.

Where used for "intensive cropping", "good" indicates soils are capable of producing sustained corn yields of 110 to 155 bushels or corn per acre under high levels of management. "Fair" indicates soils that will produce 70 to 110 bushels of corn and "poor" indicates those soils that will produce less than 70 bushels of corn per acre.

Where used for "woodland productivity", "good" indicates soils are capable of producing greater than 335 board feet per acre per year for adapted tree species. "Fair" indicates soils that will produce 260 to 335 feet and "poor" indicates those soils that will produce less than 260 board feet per acre per year.



USDA SOIL CONSERVATION SERVICE

IN COOPERATION WITH

PURDUE UNIVERSITY

AGRICULTURAL EXPERIMENT STATION

JORDAN CREEK WATERSHED

ESTIMATED SOIL LIMITATIONS OR SUITABILITIES FOR SELECTED USES

SOIL ASSN & % OF WATERSHED	SOIL SERIES 2/	DWELLINGS 3/		WASTE DISPOSAL 4/		LOCAL ROADS/ STREETS PARKING AREAS			SUITABILITY AS SOURCE OF 6/			RECREATION 7/		8/ INTN. CROP- PING	9/ WOODLAND PRODUCT- IVITY
		WITH BASEMENTS	WITHOUT BASEMENTS	SEPTIC TANK ABSORPTION FIELDS	SEWAGE LAGOONS				SAND	GRAVEL	ROADFILL	CAMPING AND PICNIC AREAS	PLAYGROUNDS & ATHLETIC FIELDS		
1 70%	Raub Chalmers Darroch	Severe: 3 Severe: 3 Severe: 3	Moderate: 3 Severe: 3 Moderate: 3,5	Severe: 2,3 Severe: 3 Severe: 2,3	Moderate: 3 Severe: 3 Moderate: 3	Severe: 5 Severe: 3,5 Severe: 5	Unsuited Unsuited Unsuited	Unsuited Unsuited Unsuited	Unsuited Unsuited Unsuited	Unsuited Unsuited Unsuited	Poor Poor Poor	Moderate: 3 Severe: 3 Moderate: 3	Moderate: 3 Severe: 3 Moderate: 3	Good Good Good	No Data No Data No Data
2 30%	Sidell Dana Darroch	Slight Moderate: 3 Severe: 3 Severe: 3	Slight Moderate: 3,5 Moderate: 3,5	Moderate: 1,2 Moderate: 2 Severe: 2,3 Severe: 2,3	Moderate: 1,7 Moderate: 7 Moderate: 3 Slight	Severe: 5 Severe: 5 Severe: 5 Severe: 5	Unsuited Unsuited Unsuited Unsuited	Unsuited Unsuited Unsuited Unsuited	Unsuited Unsuited Unsuited Unsuited	Unsuited Unsuited Unsuited Unsuited	Poor Poor Poor Poor	Slight Slight Moderate: 3 Moderate: 2,3	Moderate: 1 Moderate: 1 Moderate: 3 Moderate: 2,3	Good Good Good Good	No Data No Data No Data No Data

KEY TO POSSIBLE SOIL LIMITATIONS: 1. Slope 2. Slow permeability 3. Seasonal high water table 4. Flood hazard 5. Poor stability 6. Adverse soil texture 7. Excessive permeability

1/ Soil Association: The numbers in this column correspond with the numbered soil associations on the General Soil Map of the watershed. Each soil association is named for the major soils. The percent of each soil association in the watershed is shown.

2/ Soil Series: This column shows the name of each major soil in each association.

3/ Dwellings

With Basements: Ratings are for undisturbed soils that are evaluated for single family dwellings and other structures with similar foundation requirements. Excluded are buildings of more than three stories and other buildings with foundation loads in excess of those equal to three story dwellings. No specific bearing strength is estimated or implied.

Without Basements: The same qualifications as given above for dwellings--with basements apply here except that seasonal high water tables are not as restrictive.

4/ Waste Disposal

Septic Tank Absorption Fields: Ratings are for shallow, subsurface tile absorption fields and do not include alternative systems.

Local Roads, Streets, & Parking Areas: Ratings are for improved roads and streets having some kind of all-weather surfacing, commonly asphalt or concrete, and are expected to carry automobile traffic all year.

5/ Suitability As A Source Of

Sand: This column provides guidance about where to look for sand. Soil rated "good" contains a source of clean sand. "Fair" indicates sand with some fine material. "Poor" indicates fine material costly to remove. "Unsuited" indicates sand is not available.

Gravel: The purpose of this column is to provide guidance about where to look for gravel. The explanation of the ratings for sand" (above) apply also to "gravel".

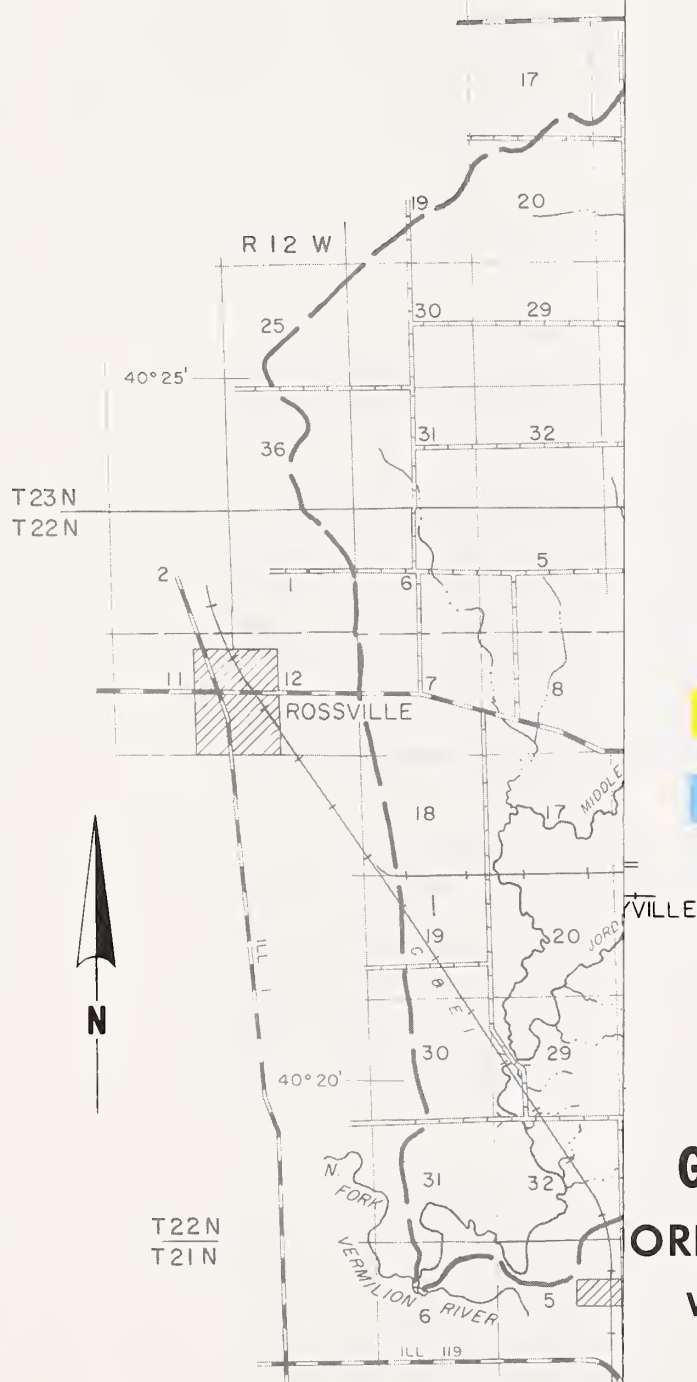
Roadfill: Refers to soil material moved from its original location and used in road construction. Generally it serves as the subgrade or foundation for the road. The whole soil, to a depth of six feet, is given one rating, assuming it will be mixed in handling.

6/ Recreation

Camp and Picnic Areas: Ratings apply to soils to be used intensively for tents and small camp trailers and the accompanying activities of outdoor living and for park-type picnic areas. Playgrounds and Athletic Fields: Ratings apply to soils to be used intensively for playgrounds for baseball, football, volleyball and other similar organized games. These areas are subject to intensive foot traffic.

7/ Intensive Cropping: The ratings are based on the potential productivity of soils to produce sustained corn yields under high levels of management.

8/ Woodland Productivity: The ratings are based on the potential productivity of soils for their primary adapted species.



LEGEND

	STATE LINE
	CIVIL TOWNSHIP LINE
	US TOWNSHIP LINE
	SECTION LINE
	PAVED ROAD
	GRAVEL ROAD
	DIRT ROAD
	RAILROAD
	CROSSING - GRADE
	CROSSING - ROAD UNDER
	BRIDGE
	PERENNIAL STREAM
	INTERMITTENT STREAM
	WATERSHED BOUNDARY

SOIL ASSOCIATIONS

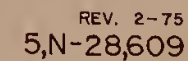
	1	RAUB, CHALMERS, DARROCH
	2	SIDELL, DANA, DARROCH

GENERAL SOILS MAP

ORDAN CREEK WATERSHED

WARREN COUNTY, INDIANA

EXHIBIT 7c



DESCRIPTIONS OF SOIL ASSOCIATIONS ON THE
GENERAL SOIL MAP

The general soil map shows two soil associations in the watershed. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A description of each soil association on the general soil map follows:

1. Raub-Chalmers-Larrock association: Deep, nearly level and gently sloping, somewhat poorly drained and poorly drained loamy soils formed in loess and the underlying glacial till and outwash and the underlying glacial till.

Raub soils are gently sloping and somewhat poorly drained. They formed in loess and the underlying glacial till. Their surface layer typically is a very dark brown silt loam about 13 inches in thickness. The subsoil is about 90 inches in thickness. In sequence from the top, the upper part is dark grayish brown friable silty clay loam, 3 inches in thickness; the next 17 inches are yellowish brown firm silty clay loam; and the lower 3 inches are yellowish brown friable clay loam. The numerous underlying material, to a depth of about 60 inches, is yellowish brown and gray loam.

Chalmers soils are nearly level and poorly drained. They formed in loess and the underlying glacial till. Their surface layer typically is a black silty clay loam about 15 inches in thickness. The subsoil is about 91 inches in thickness. In sequence from the top, the upper part is grayish brown firm silt clay loam, 4 inches in thickness; the next 10 inches are olive gray firm silty clay loam; and the lower 3 inches are gray firm loam. The numerous underlying material, to a depth of about 61 inches, is yellowish brown and dark gray loam.

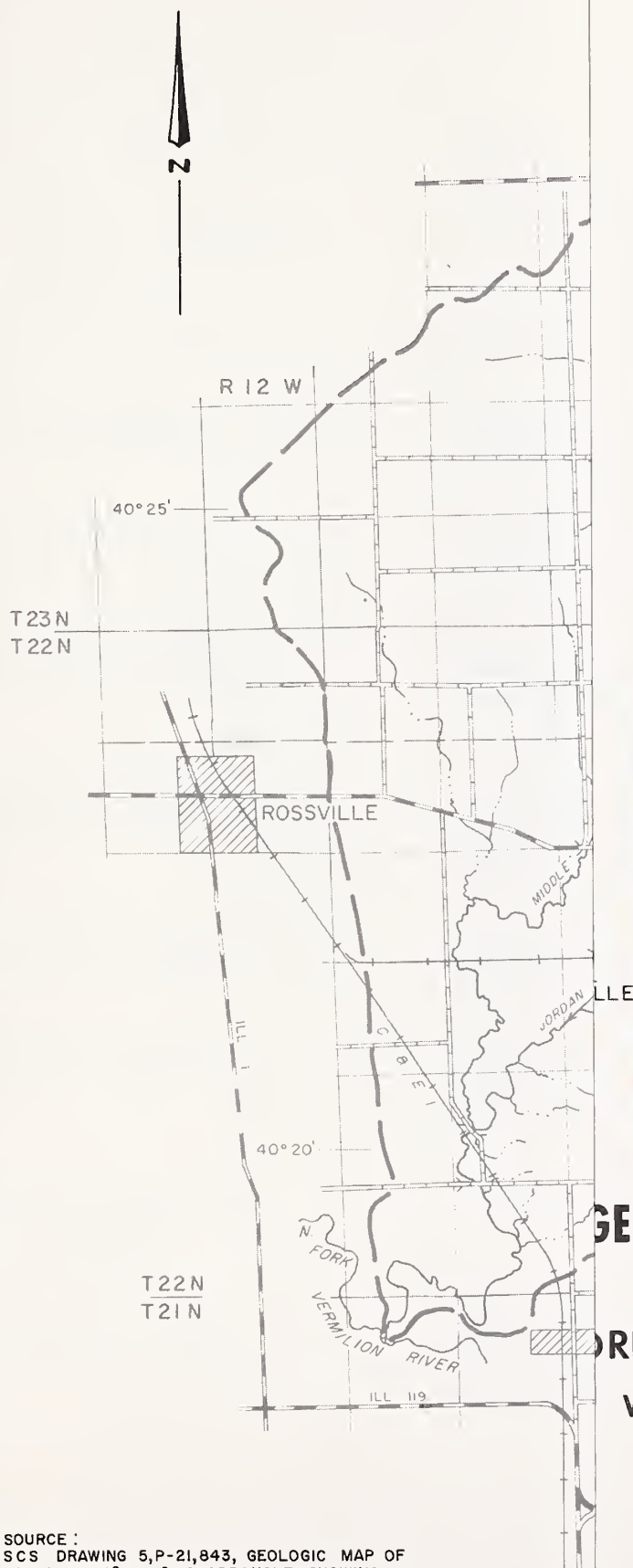
Larrock soils are nearly level to gently sloping and somewhat poorly drained. They formed in outwash. Their surface layer typically is black silt loam about 11 inches in thickness. The subsoil is about 24 inches in thickness. In sequence from the top, the upper part is very dark grayish brown firm silty clay loam about 5 inches in thickness; the next 11 inches are dark grayish brown firm clay loam; the lower 3 inches are a grayish brown friable loam. The numerous underlying material, to a depth of about 61 inches, is gray and light olive brown stratified silt loam, loam, fine sand and very fine sand.

2. Sidell-Dana-Darroch association: Deep, nearly level to moderately sloping, somewhat poorly drained to well drained loamy soils formed in loess and the underlying glacial till, outwash and the underlying glacial till, and glacial till.

Sidell soils are gently sloping and moderately sloping and well drained. They formed in loess and the underlying glacial till. Their surface layer typically is very dark grayish brown silt loam about 14 inches in thickness. The subsoil is about 30 inches in thickness. In sequence from the top, the upper 14 inches are brown firm silty clay loam; the next 10 inches are brown firm clay loam; and the lower 6 inches are yellowish brown firm clay loam. The calcareous underlying material, to a depth of about 60 inches, is yellowish brown loam.

Dana soils are nearly level and gently sloping and moderately well drained. They formed in loess and the underlying till. Their surface layer typically is very dark grayish brown silt loam about 16 inches in thickness. The subsoil is 44 inches in thickness. In sequence from the top, the upper 16 inches are dark yellowish brown firm silty clay loam with mottles in the lower part; the next 17 inches are dark yellowish brown firm mottled clay loam; and the lower 11 inches are dark brown friable mottled loam. The calcareous underlying material, to a depth of about 66 inches, is a brown mottled loam.

Darroch soils are nearly level to gently sloping and **somewhat** poorly drained. They formed in outwash. Their surface layer typically is black silt loam about 13 inches thick. The subsoil is about 24 inches in thickness. In sequence from the top, the upper part is very dark grayish brown firm silty clay loam about 5 inches in thickness; the next 11 inches are dark grayish brown firm clay loam; the lower 8 inches are a grayish brown friable loam. The calcareous underlying, to a depth of about 60 inches, is gray and light olive brown stratified silt loam, loam, fine sand, and very fine sand.



LEGEND

	STATE LINE
	CIVIL TOWNSHIP LINE
	US TOWNSHIP LINE
	SECTION LINE
	PAVED ROAD
	GRAVEL ROAD
	DIRT ROAD
	RAILROAD
	CROSSING - GRADE
	CROSSING - ROAD UNDER
	BRIDGE
	PERENNIAL STREAM
	INTERMITTENT STREAM
	WATERSHED BOUNDARY

EXPLANATION



GLACIAL TILL. Qt, MAINLY GROUND-MORaine DEPOSITS WHICH ARE TOPOGRAPHICALLY LOWER THAN THE MORE HUM-MOCKY OR RIDGELIKE END-MORaine (Qte) DEPOSITS.



MOSTLY ALLUVIUM WITH SOME VALLEY-TRAIN DEPOSITS (MOSTLY SAND, GRAVEL, AND SILT).



ICE-CONTACT STRATIFIED DRIFT (MOSTLY GRAVEL AND SAND).

GENERALIZED SURFICIAL GEOLOGY MAP

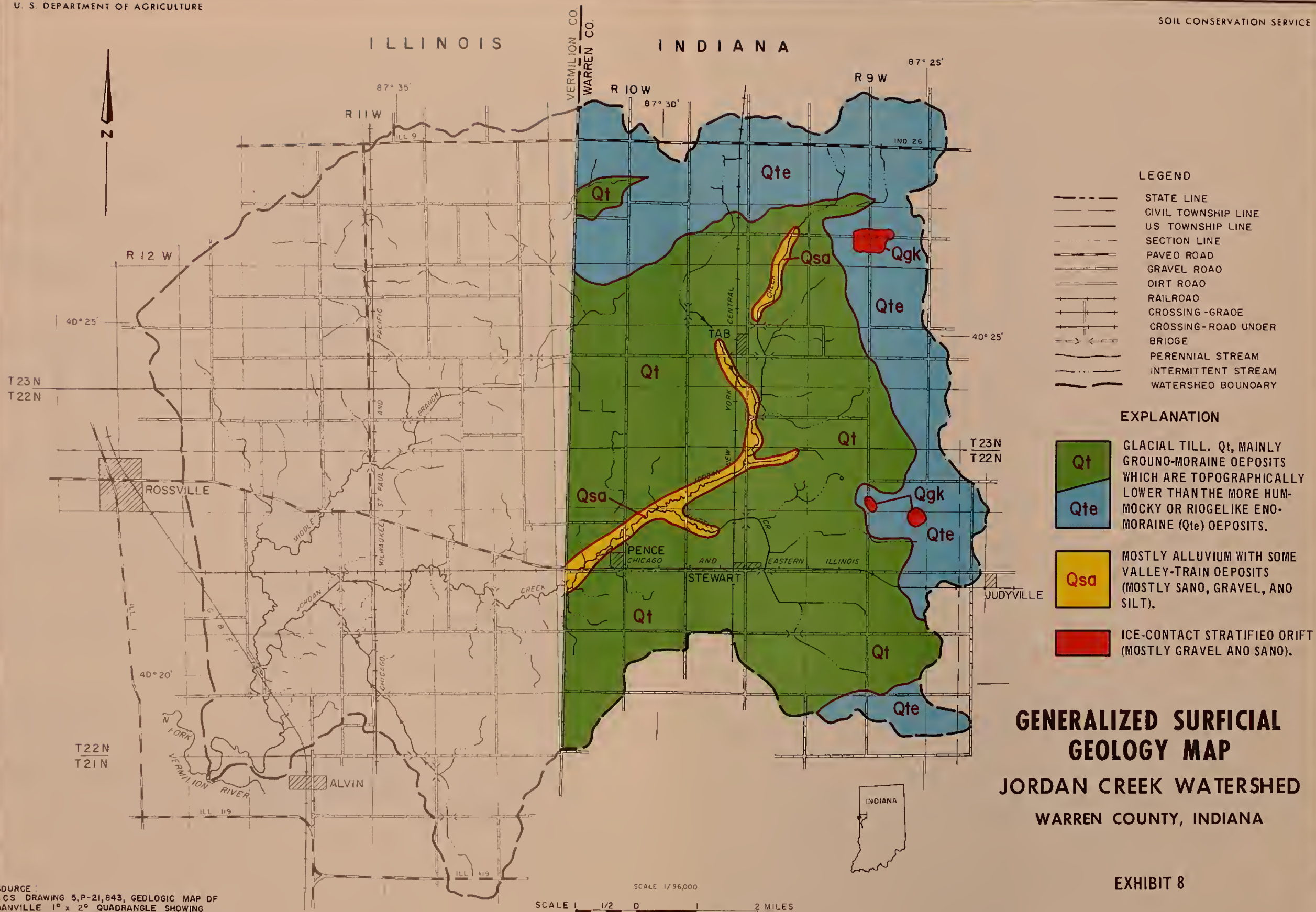
JORDAN CREEK WATERSHED WARREN COUNTY, INDIANA

EXHIBIT 8

SOURCE :
SCS DRAWING 5,P-21,843, GEOLOGIC MAP OF
DANVILLE 1° x 2° QUADRANGLE SHOWING
BEDROCK AND UNCONSOLIDATED DEPOSITS, AND
THE INDIANA GEOLOGICAL SURVEY REGIONAL
GEOLOGIC MAP NO. 2, 1966. POLYCONIC PROJECTION

USDA-SCS-LINCOLN, NEBR. 1975

2-13-75
5,0-34,999



MAMMALS OCCURRING IN THE VICINITY OF JORDAN CREEK WATERSHED

Name	Habitat	Notes on Local Populations
Opossum <i>Didelphis marsupialis</i>	farming areas and woodlands	common definitely present
Eastern mole <i>Scalopus aquaticus</i>	gardens, fields lawns and meadows avoids dry soils	probably present
Masked shrew <i>Sorex cinereus</i>	moist situations forests, open country, brushland	probably present (one of the com- monest of the shrews)
Least shrew <i>Cryptotis parva</i>	inhabits open grassy areas and marshes	probably present
Shorttail shrew <i>Blarina brevicauda</i>	is found in nearly every land habitat available	present - one of the commonest mammals of eastern United States
Keen's myotis <i>Myotis keenii</i>	caves, mine tunnels hollow trees, buildings, storm sewers	probably present
Little brown myotis <i>Myotis lucifugus</i>	caves, mine tunnels hollow trees and buildings	probably present
Indiana myotis <i>Myotis sodalis</i>	caves in winter manmade structures and hollow trees in summer	may be present rare over most of its range-W/S on on edge of range
Silver-haired bat <i>Lasionycteris noctivagans</i>	wooded areas	probably present
Big brown bat <i>Eptesicus fuscus</i>	caves, mine tunnels rock crevices, near water, wooded areas, buildings	probably present one of the com- monest and most widely distributed of our bats

Name	Habitat	Notes on Local Populations
Evening bat <i>Nycticeius humeralis</i>	hollow trees and buildings	probably present rare in the north
Red bat <i>Lasiurus borealis</i>	forested areas	probably present
Hoary bat <i>Lasiurus cinereus</i>	forested areas	probably present
Raccoon <i>Procyon lotor</i>	along streams and lake borders, near wooded areas or rock cliffs	common definitely present
Least weasel <i>Mustela rixosa</i>	not restricted	may be present rare over most of its range-W/S on edge of range
Longtail weasel <i>Mustela frenata</i>	not restricted near water	probably present most widely dis- tributed and most common of the weasels
Mink <i>Mustela vison</i>	along streams and lakes	common present
Striped skunk <i>Mephitis mephitis</i>	found practically all land habitats	common definitely present
Red fox <i>Vulpes fulva</i>	mixture of forest and open country preferred	common present
Gray fox <i>Urocyon cinereoargenteus</i>	Chaparral, open forests and rimrock country	probably present
Coyote <i>Canis latrans</i>	prairies, open woodlands, brushy or boulder strewn areas	not common might be present
Woodchuck <i>Marmota monax</i>	open woods, brushy and rocky ravines	definitely present

Name	Habitat	Notes on Local Populations
Meadow vole <i>Microtus pennsylvanicus</i>	low moist areas or high grass lands with rank growths of ve- getation near streams, lakes and swamps	probably present
Prairie vole <i>Microtus ochrogaster</i>	open prairies, fence rows, r.r. rights-of- way and old cemeteries feeding, but appears in various land habitats not re- stricted	probably present
Pine vole <i>Microtus pinetorum</i>	usually a forest floor with a thick layer of duff, de- ciduous forest in north, pine in south	probably present
Meadow jumping mouse <i>Zapus hudsonius</i>	damp meadow and forest areas	may be present
Eastern cottontail <i>Sylvilagus floridanus</i>	heavy brush, strips of forest with open areas nearby, edges of swamps, weed patches	definitely present
Whitetail deer <i>Odocoileus virginianus</i>	forest, swamp and open brushy areas woodlands in crop- land areas	probably present

Name	Habitat	Notes on Local Populations
Franklin ground squirrel <i>Citellus franklini</i>	prairie	may be present W/S extreme east edge of range
Thirteen-lined ground squirrel <i>Citellus tridcemlineatus</i>	grassy areas some- times along roads	probably present
Eastern chipmunk <i>Tamias striatus</i>	deciduous forests, brushy areas	common definitely present
Eastern grey squirrel <i>Sciurus carolinensis</i>	hardwood forests with nut trees	probably present
Eastern fox squirrel <i>Sciurus niger</i>	open hardwood lots in north, pine forests with clearings in south	common definitely present
Southern flying squirrel <i>Glaucomys volans</i>	woodlots and forests of deciduous or mixed deciduous and con- iferous trees	probably present
Muskrat <i>Ondatra zibethica</i>	marshes, edges of ponds, lakes and streams, cattails, water lilies	common definitely present
Plains pocket gopher <i>Geomys bursarius</i>	deep soils in farming areas, alfalfa and other hay fields	may be present W/S on edge of range
White-footed mouse <i>Peromyscus leucopus</i>	woods or brushy areas preferred sometimes open areas	definitely present
Deer mouse <i>Peromyscus maniculatus</i>	open to brushy or wooded areas, dry land	definitely present
Southern bog lemming <i>Synaptomus cooperi</i>	low damp bogs and meadows with heavy growth of vegetation	probably present

JORDAN CREEK WATERSHED

Potential Birds in Watershed and Surrounding Area

<u>Species</u>	<u>Migrant or Resident</u>	<u>Occurrence in W/S</u>
Common Loon	M	Rare
Red-throated Loon	M	Rare
GREBES		
Horned	M	Rare
Pied Billed	R&M	Common
Double Breasted Cormorant	M	Very Rare
HERONS		
Great Blue	SR&M	Common
Egrets		
American	SR&M	Rare
Green	SR	Common
Black-crowned Night	M	Rare
BITTERNS		
American	M	Rare
Least	SR&M	Rare
GEESE		
Canada	M	Common
Snow	M	Uncommon
Blue	M	Uncommon
DUCKS		
Mallard	WR&M	Common
Black	WR&M	Common
Gadwall	M	Uncommon
Baldpate	M	Uncommon
Pintail	M	Uncommon
Green-winged Teal	M	Uncommon
Blue-winged Teal	M	Uncommon
Shoveller	M	Uncommon
Wood	SR&M	Common
Redhead	M	Rare
Ring-nicked	M	Common
Canvas-back	M	Rare
Lesser Scaup	M	Common
American Golden-eye	WR&M	Common
Buffle-head	M	Uncommon
Old-squaw	M	Accidental
White-winged Scoter	M	Accidental
Ruddy	M	Uncommon
Hooded Merganser	M	Uncommon
American Merganser	M	Uncommon
Red-breasted Merganser	M	Uncommon

JORDAN CREEK WATERSHED

Potential Birds in Watershed and Surrounding Area

<u>Species</u>	<u>Migrant or Resident</u>	<u>Occurrence in W/S</u>
Turkey Vulture	R	Common
Black Vulture	SR	Uncommon
HAWKS		
Sharp-shinned	R	Uncommon
Cooper's	R	Uncommon
Red-tailed	R	Common
Red-shouldered	R	Common
Broad-winged	SR	Uncommon
Rough-legged	WR	Uncommon
Bald Eagle	Winter Visitor	Very Rare
Marsh	R&M	Uncommon
Osprey	M	Rare
Duck (endangered)	M	Accidental
Pigeon	M	Rare
Bob-white	R	Common
Ring-necked Pheasant	R	Uncommon
Sandhill Crane	M	Rare
RAILS		
King	SR	Rare
Virginia	SR	Rare
Sora	SR	Rare
Florida Gallinule	SR&M	Rare
Coot	M	Uncommon
PLOVERS		
Piping	M	Rare
Semipalmated	M	Rare
Killdeer	R	Common
Golden	M	Uncommon
Black-bellied	M	Uncommon
Ruddy Turnstone	M	Rare
Woodcock	SR	Common
Wilson's Snipe	M	Rare
Upland Plover	M	Rare
Spotted Sandpiper	SR	Common
Solitary Sandpiper	M	Uncommon
Greater Yellowlegs	M	Rare
Lesser Yellowlegs	M	Rare
Pectoral Sandpiper	M	Uncommon
Least Sandpiper	M	Uncommon
Dowitcher	M	Rare
Stilt Sandpiper	M	Very Rare
Sanderling	M	Very Rare

JORDAN CREEK WATERSHED

Potential Birds in Watershed and Surrounding Area

<u>Species</u>	<u>Migrant or Resident</u>	<u>Occurrence in W/S</u>
Blue-gray Gnatcatcher	SR	Common
Golden-crowned Kinglet	M	Rare
Ruby-crowned Kinglet	WR	Uncommon
American Pipit	M	Uncommon
Cedar Waxwing	R	Common
Migrant Shrike	R	Uncommon
Starling	R	Common
VIREOS		
White-eyed	SR	Uncommon
Bell's	SR	Rare
Yellow-throated	SR	Uncommon
Red-eyed	SR	Common
Philadelphia	M	Uncommon
WARBLERS		
Black and White	SR	Common
Prothonotary	SR	Uncommon
Worm-eating	SR	Rare
Golden-winged	M	Rare
Blue-winged	M	Uncommon
Tennessee	M	Common
Orange-crowned	M	Rare
Nashville	M	Common
Parula	SR	Uncommon
Yellow	SR	Common
Magnolia	M	Common
Cape May	M	Rare
Black-throated Blue	M	Rare
Myrtle	M	Common
Black-throated Green	M	Common
Cerulean	SR	Common
Blackburnian	M	Common
Yellow-throated (Sycamore)	SR	Uncommon
Chestnut-sided	M	Common
Bay-breasted	M	Common
Black-poll	M	Uncommon
Pine	M	Rare
Prairie	SR	Rare
Palm	M	Common
Oven-bird	SR	Common
Northern Water Thrush	M	Rare
Louisiana Water Thrush	SR	Common

JORDAN CREEK WATERSHED

Potential Birds in Watershed and Surrounding Area

<u>Species</u>	<u>Migrant or Resident</u>	<u>Occurrence in W/S</u>
Kentucky	SR	Common
Connecticut	M	Rare
Mourning	M	Rare
Yellow-throat	SR	Common
Yellow-breasted Chat	SR	Uncommon
Hooded	M	Rare
Wilson's	M	Rare
Canada	M	Uncommon
Redstart	M	Common
English Sparrow	R	Very Common
Bobolink	M	Uncommon
E. Meadowlark	R	Common
W. Meadowlark	R	Uncommon
Red-wing	R	Common
Orchard Oriole	SR	Uncommon
Baltimore Oriole	SR	Uncommon
Rusty Blackbird	M	Uncommon
Grackle	R	Common
Cowbird	SR	Common
Scarlet Tanager	SR	Uncommon
Summer Tanager	SR	Common
Cardinal	R	Common
Rose-breaster Grosbeak	M	Uncommon
Indigo Bunting	SR	Common
Dickcissel	SR	Uncommon
Purple Finch	WR	Uncommon
Goldfinch	R	Common
Towhee	R	Common
SPARROWS		
Savannah	M	Uncommon
Grasshopper	SR	Uncommon
Henslow's	SR	Uncommon
Vesper	WR	Uncommon
Lark	M	Rare
Bachman's	SR	Rare
Slat-colored Junco	WR	Common
Tree	WR	Common
Chipping	SR	Common

JORDAN CREEK WATERSHED

Potential Birds in Watershed and Surrounding Area

<u>Species</u>	<u>Migrant or Resident</u>	<u>Occurrence in W/S</u>
Least	M	Common
Wood Pewee	SR	Common
Olive-sided	M	Rare
Horned Lark	R	Common
SWALLOWS		
Tree	M	Uncommon
Bank	SR	Uncommon
Rough-winged	SR	Uncommon
Barn	SR	Common
Cliff	M	Uncommon
Purple Martin	SR	Common
Blue Jay	R	Common
Crow	R	Common
Black-capped Chickadee	R&M	Common
Carolina Chickadee	R	Common
Tufted Titmouse	R	Common
White-breasted Nuthatch	SR	Uncommon
Red-breasted Nuthatch	WR	Rare
Brown Creeper	WR	Common
WRENS		
House	SR	Common
Winter	WR	Rare
Bewick's	Visitor	Rare
Carolina	R	Common
Long-billed Marsh	M	Rare
Short-b9lled Marsh	M	Rare
Mockingbird	R	Common
Catbird	SR	Common
Brown Thrasher	SR	Common
THRUSHES		
Robin	R	Common
Wood	SR	Common
Hermit	M	Common
Olive-backed	M	Uncommon
Gray checked	M	Rare
Veery	M	Uncommon
Bluebird	R	Uncommon

JORDAN CREEK WATERSHED

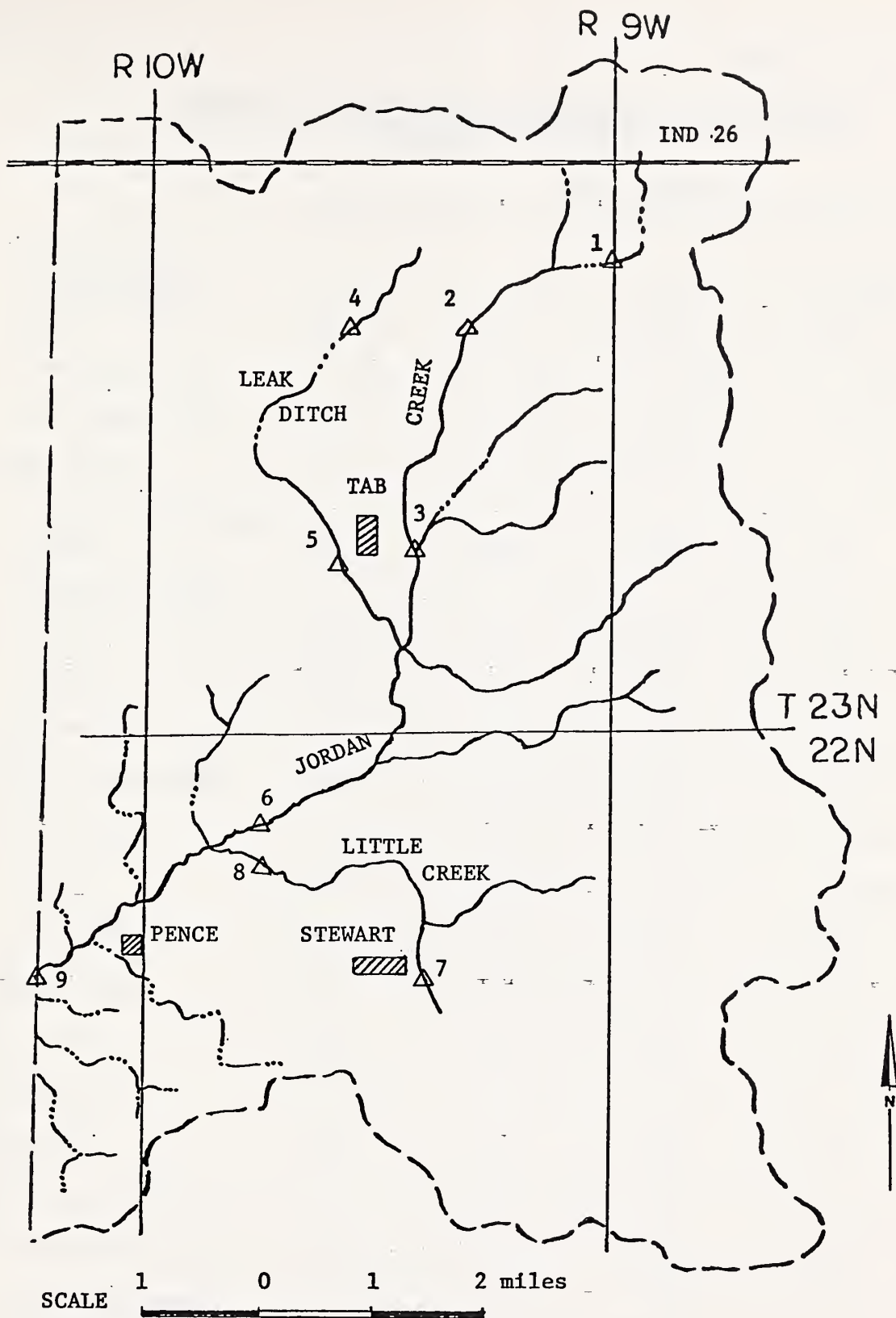
Potential Birds in Watershed and Surrounding Area

<u>Species</u>	<u>Migrant or Resident</u>	<u>Occurrence in W/S</u>
GULLS		
Herring	M	Uncommon
Ring-billed	M	Uncommon
Bonaparte's	M	Rare
TERNs		
Foster's	M	Very Rare
Common	M	Rare
Caspian	M	Very Rare
Black	M	Very Rare
Mourning Dove	R	Common
Yellow-billed Cuckoo	SR	Uncommon
Black-billed Cuckoo	SR	Uncommon
OWLS		
Barn	R	Uncommon
Screech	R	Uncommon
Great Horned	R	Common
Barred	R	Common
Long-eared	WR	Uncommon
Short-eared	WR	Uncommon
Whip-poor-will	SR	Uncommon
Nighthawk	SR&M	Common
Chimney Swift	SR	Common
Rubythroated Hummingbird	SR	Common
Belted Kingfisher	SR	Common
WOODPECKERS		
Flicker	R	Common
Pileated	R	Rare
Red-bellied	R	Uncommon
Red-headed	R	Common
Yellow-bellied Sapsucker	WR	Uncommon
Hairy	R	Uncommon
Downy	R	Common
FLYCATCHERS		
Kingbird	SR	Common
Crested	SR	Common
Phoebe	SR	Common
Arcadian	SR	Common
Alder	SR	Uncommon

JORDAN CREEK WATERSHED

Potential Birds in Watershed and Surrounding Area

<u>Species</u>	<u>Migrant or Resident</u>	<u>Occurence in W/S</u>
Field	R	Common
White-crowned	M	Common
White-throated	M	Common
Fox	WR&M	Uncommon
Lincoln's	M	Rare
Swamp	WR	Rare
Song	R	Common
Lapland Longspur	Winter Visitor	Uncommon
Snow Bunting	Winter Visitor	Uncommon



△ WATER QUALITY SAMPLING SITES

EXHIBIT 10

JORDAN CREEK WATERSHED
WARREN COUNTY, INDIANA

SUMMARY OF JORDAN CREEK WATER-QUALITY DATA COLLECTED
(September 24, 1974)

	Site Numbers				
	3	5	6	8	9
Drainage area (Square Miles)	11.7	5.2	26.6	15.6	51.2
Time	1420	1520	1700	1730	1810
Discharge (cfs)	.25	.09	.44	.13	.59
Water Temp. ($^{\circ}$ C)	19.3	21.0	19.3	16.0	16.2
**pH, Field	8.2	7.2	8.6	8.3	8.5
Specific Conductance (umhos)	602	635	526	647	559
Dissolved oxygen (% Sat.)	97	92	126	92	97
Calcium	66	75	64	83	75
Magnesium	33	32	20	20	20
**Dissolved oxygen	8.9	8.3	11.6	9.1	9.6
Potassium	1.4	2.1	1.8	2.4	1.7
Sodium	5.3	8.7	7.0	6.8	6.7
Bicarbonate	260	332	227	286	246
Carbonate	0	0	0	0	0
Chloride	16	10	16	12	15
Fluoride	.3	.5	.3	.4	.3
Sulfate	63	36	57	67	59
Silica dioxide	4.1	11	3.9	5.6	4.9
Dissolved solids	318	341	283	339	305
Total Alkalinity (as CaCO ₃)	213	272	186	235	202
Total hardness (as CaCO ₃)	300	320	240	290	270
Noncarbonate hardness (as CaCO ₃)	87	47	56	55	68

**Readings vary with biological activity

	Site Numbers				
	3	5	6	8	9
Ammonia, dissolved (as N)	.15	.23	.11	.18	.14
Organic nitrogen dissolved (as N)	.19	.20	.33	1.1	.27
Kjeldahl nitrogen dissolved (as N)	.34	.43	.44	1.3	.41
Nitrite dissolved (as N)	0.00	0.00	0.00	0 0.00	0.00
Nitrate dissolved (as N)	.19	.04	.08	.10	.25
Orthophosphate dissolved (as P)	.01	.02	.01	.02	.02
Phosphate dissolved (as P)	.01	.03	.01	.03	.03
Organic carbon dissolved	4.8	5.3		5.9	5.8
Aluminum total	.28	.75		.18	.69
Iron total	.54	1.60		1.00	1.00
Iron dissolved	.06	.08	.04	.08	.04
Manganese total	.09	.50		.25	.21
Manganese dissolved	.04		.05	.12	.09
Fecal coliform*	220	240	1400	1200	770
Fecal streptococci*	330	210	85	130	140

MILLIGRAMS PER LITRE

SURFACE WATER QUALITY ANALYSES - SEPTEMBER 24, 1974

Site	Site Location	Discharge (cfs)	W. Temp. (°C)	SC (umhos)	DO (% Sat.)
1	Jordan Creek	0.08	14.6	593	134
2	Jordan Creek	0.16	15.0	690	85
3	Jordan Creek	0.40	18.8	629	105
4	Leak Ditch	0.05	16.1	652	105
5	Leak Ditch	0.12	10.5	666	105
6	Jordan Creek	0.48	15.2	647	111
7	Little Creek	No Flow			
8	Little Creek	0.32	14.2	689	101
9	Jordan Creek	0.72	15.0	606	118

*Colonies per 100 millilitres

STRUCTURE DATA
(Main Channels)
Jordan Creek Watershed, Indiana

Channel Name and Reach	Station	Drainage Area Sq. Mi.	Required Capacity cfs.	Channel Dimensions			"n" Value As Built	Velocities ft./sec.		Excavation Cu.-Yds.	Purpose	Before Project		
				Bottom Width	Grade	Depth of Flow		Aged	As Built			Type of Channel	Flow Condition	
Jordan Creek Reach B	101+00 235+00 235+00 410+86	5.5 16.0	160 400	4	.0021 NO	4.0 WORK	.040	.028	2.9	3.7	13,000	MP	M	I
Jordan Creek Reach C	410+86 508+00 508+00 578+08	28.0 28.4	610	20	.00074 NO	5.7 WORK	.030	.025	3.3	3.8	14,000	MP	M	Pr
Jordan Creek Reach E	578+08 668+00	51.0	1050	DEBRIS	REMOVAL					-0-		MP	M	Pr
Leak Ditch Reach A	8+00 35+70 35+70 65+00 65+00 170+12 170+12 226+22 226+22 285+00	1.5 2.6 4.3 7.1 7.1	55 86 130 200 200	4 4 8	.0044 .0021 NO .0007 NO	2.1 3.0 WORK 4.6 WORK	.040 .040 .035	.028 .028 .028	2.9 2.4 2.2	3.7 3.2 2.6		MP MP MP	M M M	I I I
Little Creek Reach D	23+60 125+90 125+90 225+00 225+00 323+24 323+24 358+00	5.6 10.0 15.0 16.3	160 270 375 410	4 6 10	.00066 .00066 .0007 NO	5.1 5.3 5.9 WORK	.040 .040 .035	.028 .028 .028	1.9 2.1 2.6	2.4 2.8 3.0		MP MP MP	M M M	I I I

1/ Side slopes on constructed side are 3:1 and on unconstructed side are approximately 2:1.

2/ Depths shown are normal depths for the capacity required.

3/ Purpose: MP-Multiple Purpose

4/ (M)-Manned ditch or previously modified channel.

5/ I-Intermittent - continuous flow through some seasons of the year but little or no flow through other seasons.
Pr-Perennial - flows at all times except during extreme drought.

October 1975



APPENDIX B

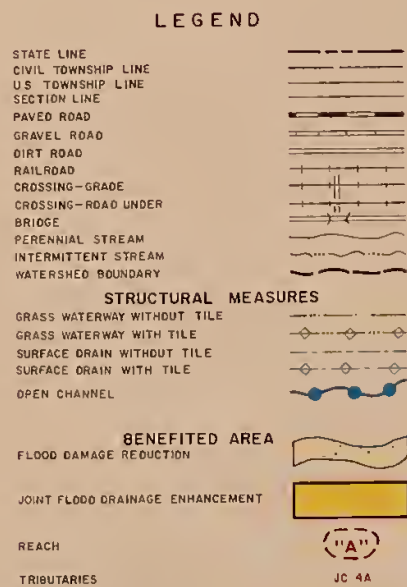
SOURCE:
S C S BASE 5,P-21,843
FURNISHED BY FIELD
POLYCONIC PROJECTION
STANDARD MERIDIAN 85W 121°

12-10-75
5,R-35,477

PROJECT MAP

JORDAN CREEK WATERSHED

WARREN COUNTY, INDIANA



SOURCE
S.C.S. BASE 5, P-21,843 AND DATA
FURNISHED BY FIELD TECHNICIANS
POLYCONIC PROJECTION

SCALE 1 1/2 0 1 2 MILES
SCALE 1/10,000



APPENDIX B

12-10-75
5R-35,477

COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Jordan Creek Watershed, Indiana

(Dollars)

Evaluation Unit	Average Annual Benefits <u>1/</u>				Total	Average Annual Cost	Benefit Cost Ratio
	Damage Reduction	More Intensive Land Use	Drainage	Secondary			
Reaches A-E	11,840	134,250	134,250	201,000	481,340	102,410	4.7:1.0
Reach J	--	4,250	4,250	6,220	14,720	2,650	5.6:1.0
Project Administration	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXX	15,360	XXXXXXX
GRAND TOTAL	11,840	138,500	138,500	207,220	496,060	120,420	4.1:1.0

1/ Price Base: Agriculture prices current normalized (WRC-Feb. 1974). Other items current 1974.



OHIO RIVER BASIN COMMISSION

Suite 208-20
Cincinnati, Ohio 45202

36 East Fourth Street
513/684-3831 (FTS)

May 8, 1975

Mr. Cletus J. Gillman
State Conservationist
Soil Conservation Service, USDA
Atkinson Square-West, Suite 2200
5610 Crawfordsville Road
Indianapolis, Indiana 45224

Dear Mr. Gillman:

Thank you for your letter of March 14, 1975 inviting comments of the Ohio River Basin Commission on the Draft Environmental Impact Statement (EIS) for the Jordan Creek Watershed, Warren County, Indiana.

In my opinion, the EIS has been properly coordinated with the Commission members.

The Ohio River Basin Commission staff has reviewed the draft EIS and finds no indication that the proposed action would not be compatible with the ORBC CCJP as it exists today.

The Commission looks forward to a continuing cooperative effort with your Department and appreciates your action in keeping us well informed.

Sincerely,

Fred E. Morr
Chairman

cc: Council on Environmental Quality
Joseph D. Cloud, Indiana



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

22 MAY 1975

Honorable Robert W. Long
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the State Conservationist, by letter dated 14 March 1975, requested the views of the Secretary of the Army on the Watershed Work Plan and Draft Environmental Impact Statement for Jordan Creek Watershed, Warren County, Indiana.

We have reviewed the work plan and foresee no conflict with any projects or current proposals of this Department.

The draft environmental impact statement is considered generally satisfactory.

Sincerely,

A handwritten signature in cursive script, reading "Charles R. Ford", is positioned below the word "Sincerely,".

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

REGION V

300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

OFFICE OF
THE REGIONAL DIRECTOR

May 5, 1975

Mr. Cletus J. Gillman
State Conservationist
Soil Conservation Service
Dept. of Agriculture
5610 Crawfordsville Rd., Suite 2200
Indianapolis, Ind. 46224

RE: Draft Environmental Impact Statement
Jordon Creek Watershed, Indiana

Dear Mr. Gillman:

We have reviewed the Draft Environmental Impact Statement for the above project. To our knowledge, and based upon the information provided, this project will not impact to any significant degree on the health, education or welfare of the population.

Sincerely yours,

Robert A. Ford
Regional Environmental Officer

cc: Charles Custard
Warren Muir



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

In reply refer to:
(ER-75/262)

JUN 3 1975

Dear Mr. Gillman:

Thank you for the letter of March 14, 1975, requesting our views and comments on a proposed work plan and draft environmental statement for the Jordan Creek Watershed, Warren County, Indiana.

We have completed our review of both documents and will provide some general comments followed by specific comments on the work plan and the draft statement.

GENERAL COMMENTS

Both the work plan and draft statement fail to contain an adequate discussion and evaluation of the fish and wildlife resources of the study area. The basic shortcoming deals with the measures proposed for mitigation of project induced damages to the fish and wildlife resources. During the project planning phase, a multi-agency biology team was formed with members from SCS, FWS, and IDNR; the team developed several recommendations during their November 6, 1974 field review to mitigate fish and wildlife losses. The work plan should identify these proposals, evaluate their merits and provide the basis used to adopt or reject these mitigation features.

The following measures are of specific interest to us from a fish and wildlife standpoint and we believe the work plan and draft environmental statement should identify and evaluate these proposals:

- a. We believe the construction of artificial pools and riffles should be provided in that section of the Jordan River below the junction of Leak Ditch which is proposed for channelization. If these structures are no longer needed to minimize aquatic losses, the work plan and draft statement should contain the basis for excluding these features from the plan.



- b. Both of the final paragraphs on pages 32 and 40 of the work plan discuss revegetation and mitigation planting along the project channel, but this is not the mitigation work developed by the biology team. They recommended that the 10 foot mitigation planting strip be increased to 15 feet in the lower section of the watershed where channel dimensions are to be made wider. Further, the team recommended that the 15 foot strip be planted to three rows of woody vegetation; Japonica lespedeza, autumn olive and dogwood. The ten foot strip in the upper watershed was to have a row of autumn olive and a row of dogwood. It was also recommended that the area be seeded with native prairie grass (big blue stem and switch grass) rather than the commonly used mixture of grasses and legumes.

In addition to the foregoing, we wish to recommend the inclusion of the following measures to further reduce the adverse project effects on fish and wildlife resources:

- a. On page 31 of the work plan the use of armor plating (gravel blanket) is mentioned but gravel size is not given. While smaller size gravel (1 to 2 inches in diameter) does provide some benthic habitat, larger size stones can provide a more stable habitat for aquatic invertebrates especially during periods of high flow. Hence, we recommend that these gravel blanks consist, in part, of the larger size stones to stabilize the aquatic habitat.
- b. The maintenance travelway (see page 48) often becomes rutted and vegetation in these areas is damaged or destroyed by vehicles used in the maintenance inspection. This lessens the value of the area for wildlife and could create erosion problems. We recommend that the maintenance agreement require protection of this vegetation. Further, spraying of herbicides on channel banks to control vegetation can be very detrimental to fish and wildlife. Mowing and hand cutting of woody vegetation, stacking this brush in piles on the spoil banks would be a more desirable practice from a fish and wildlife standpoint. We would like to see the maintenance agreement accommodate these concerns also.

- c. Pages 48 and 49 of the report discuss an establishment period for vegetation restoration. ⑦ The period contemplated may not be long enough to establish this replacement vegetation, especially where native prairie grasses are to be used. We believe these wildlife plantings should be established and the timespan should be that which is necessary to establish the vegetation.

WORK PLAN

In addition to giving consideration to the general comments in the work plan we have the following comments.

The review did not surface any conflict with any existing or proposed units of the National Park System. Further, the work plan does contain an adequate discussion on the outdoor recreation resources of the study area.

The statements on page 15 concerning mineral resources are accurate. Because of coalbed thickness, depth and reliability category (measured and indicated), the Minshall coalbed, referred to in this report, is not included in the Bureau of Mines' coal reserve base for Warren County.

ENVIRONMENTAL STATEMENT

We believe the appropriate sections of the impact statement should discuss and evaluate the mitigation measures recommended by the multi-agency biology team and the additional measures described in this letter. We also submit the following comments on the specific sections of the statement:

II. Summary Sheet

D. Description of the Action

- ⑧ It is suggested that the full scope of proposed work to be summarized on the Summary Sheet of the environmental statement (p. 1, paragraph D). Work proposed, but not presently mentioned until later in the draft environmental statement, includes: (1) construction of 46.7 miles

of surface drains measuring 1-3 feet deep and at least 8 feet wide at the bottom (p. 9); (2) installation of 19.8 miles of drainage tile with a diameter of 8 inches or more (p. 9); (3) clearing of log-jam and other debris along 1.5 miles of channel; (4) replacement of one county road bridge (p. 7); (5) construction of 5.1 miles of grassed waterways; (6) construction of about 50 grade-stabilization structures (p. 5); and (7) mapping of 10, 100 acres of soil during the project.

III. Project Identification and Environmental Setting

D. Planned Project

1. Land Treatment

- ⑨ In respect to land treatment discussed on page 4, it is unclear how much of the 27, 517 acres to be treated by the end of the installation period is already treated, and how much is directly attributable to the proposed project.

E. Environmental Setting

1. Physical Resources

- ⑩ The last sentence on page 18 of the environmental impact statement mentions the U. S. Geological Survey as referring to "future levels" of insecticide concentration when it should state that "present levels of concentration" are not considered alarming. In actuality, we have no idea what "the future" concentrations will be.

6. Archaeological, Historical, and Scenic Resources

- ⑪ The word National in the second line of the opening paragraph should be Natural to conform to footnote 3. Although no historic resources in the Jordan Creek Watershed have been identified in the Indiana Guide to Historic Places cited in footnote 4, the State Historic Preservation Officer (Mr. Joseph D. Cloud, Director, Department of Natural Resources, State of Indiana, 615 State Office Building, Indianapolis, Indiana 42604) should be consulted with regard to any property within the project area which may be eligible for inclusion on the National Register of Historic Places.
- ⑫ The extent of the archeological "study" conducted by the Indiana Historical Society is unclear. In the event that it was not a complete archeological reconnaissance survey of all the structural features identified on pages 5-9, the Society should be consulted with regard to the need for such a survey.
- ⑬ We suggest that the final environmental statement not contain any map such as Exhibit 10 in Appendix A that might expose valuable cultural resources to vandalism. Instead, we suggest that the archeologist conducting the survey be asked to provide a document clearly stating what effect the project may have upon sites discovered during the archeological reconnaissance survey, as well as his recommendation for preservation or salvage.

V. Environmental Impact

E. Adverse Environmental Effects

- ⑭ Page 39; point 1, "Change of 290 acres of grassland, and 5 acres of idle land used as wildlife habitat", needs further explanation. We did not find these numbers used anywhere else regarding expected habitat losses (unless they are on the missing page 34).

The proposed project should not have any significant impact on mineral resources.

VII. Short-Term Vs. Long-Term Use of Resources

- ①⑥ Page 43 states that current land use in the proposed permanent easement includes 48 acres of forest land, yet in the description of the project area on page 13, only 25 acres of forest land are listed for the entire watershed. This situation should be clarified.

We trust the foregoing information will assist you in finalizing your report and environmental statement.

Sincerely yours,



Deputy Assistant Secretary of the Interior

Mr. Cletus J. Gillman
State Conservationist
Soil Conservation Service
5610 Crawfordsville Road
Suite 2200
Indianapolis, Indiana 46224



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

• MAY 2 1975

Mr. Cletus J. Gillman
State Conservationist
Soil Conservation Service
5610 Crawfordsville Road
Indianapolis, Indiana 46224

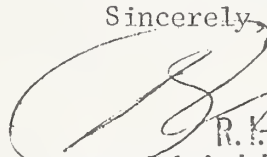
Dear Mr. Gillman:

This is in response to your letter of 14 March 1975 addressed to Commandant, U. S. Coast Guard concerning a draft environmental impact statement for the Jordan Creek Watershed, Warren County, Indiana.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,


R. K. PRICE
Rear Admiral, U. S. Coast Guard
Chief, Office of Marine Environment
and Systems



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604



Mr. Cletus J. Gillman
State Conservationist
United States Department of Agriculture
Soil Conservation Service
5610 Crawfordsville Road
Suite 2200
Indianapolis, Indiana 46224

MAY 13 1975

Dear Mr. Gillman:

In response to your letter of March 14, 1975 we have completed our review of the Draft Environmental Impact Statement (EIS) for Jordan Creek Watershed, Warren County, Indiana. Our environmental concerns are in regard to water quality and we believe additional information should be provided in the EIS to adequately address the environmental impacts upon nutrients and sedimentation.

We appreciate the opportunity that you provided us earlier this year to review and comment on the Preliminary Draft EIS. Although the Draft EIS adequately responds to the comments submitted in our letter to you dated February 19, 1975, the following comments should be addressed in the Final EIS.

- ① The subsurface drains that are designed to remove water from ponded areas will also increase the nutrient loading and thus algal growth within the Jordan Creek Watershed. This extent of this impact should be discussed.

- ② With regard to structural measures, the number of sediment traps and the length of the selected intervals to reduce sediment movement downstream should be given. If this information cannot be determined at this time, the Final EIS should provide a description of the guidelines that will be used to determine when and where sediment traps will be constructed.

As indicated in the above discussion and in accordance with EPA procedures, we have classified this project as IO (Lack of Objections) and we have rated the Draft EIS as Category 2 which means additional information should be provided in the Final EIS to adequately assess the environmental impacts of the project. In accordance with our responsibility to inform the public of our views on Federal actions, the classification and date of our comments will appear in the Federal Register.

If you or your staff have any questions concerning our comments,
please contact Mr. Gary A. Williams at 312-353-5756.

Sincerely yours,

Gary A. Williams

for Donald A. Wallgren
Chief,
Federal Activities Branch

Advisory Council
On Historic Preservation
1522 K Street N.W. Suite 430
Washington D.C. 20005

April 7, 1975

Mr. Cletus J. Gillman
State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
5610 Crawfordsville Road
Suite 2200
Indianapolis, Indiana 46224

Dear Mr. Gillman:

This is in response to your request of March 14, 1975, for comments on the draft environmental statement for the Jordan Creek Watershed, Warren County, Indiana. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969 and the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800), the Advisory Council on Historic Preservation has determined that while you have discussed the historical and archeological aspects related to the undertaking, the Advisory Council needs additional information to adequately evaluate the effects on these cultural resources. Please furnish additional data indicating:

a. Compliance with Section 1(3) of Executive Order 11593 of May 13, 1971.

- ① 1) In compliance with Section 1(3) of the Executive Order, the Council requests that it be furnished by the Soil Conservation Service (SCS) with an indication as to whether or not there are historical sites in the project area which may be eligible for inclusion in the National Register of Historic Places. If such information is unavailable, an historical survey should be undertaken by SCS for the purposes of gathering such information.
- ② 2) In further compliance with Section 1(3) of the Executive Order, the Council requests that it be furnished by SCS with a determination as to whether or not the fifteen archeological sites identified by the Indiana Historical Society in its archeological survey of the project area are eligible for inclusion in the National Register of Historic Places.

The Advisory Council requests that it be provided this information before publication and circulation of the final environmental statement on the Jordan Creek Watershed.

b. Consultation with the Indiana State Historic Preservation Officer.

③ The Advisory Council notes that the comments of Indiana State Historic Preservation Officer (SHPO) have been requested by the SCS. The Council suggests that a copy of the Indiana SHPO's response be included in the final environmental statement.

Co-ordination with the appropriate SHPO is crucial in the early stages of decision-making and project planning. Therefore, the Council further suggests that future draft environmental statements prepared by SCS contain evidence of contact with the SHPO. Whenever possible written comments of the appropriate SHPO should be appended to the draft statement.

Should you have any questions or require any additional assistance, please contact Jordan Tannenbaum of the Advisory Council staff at 202-254-3380.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "John D. McDermott", with a stylized flourish extending to the right.

John D. McDermott
Director, Office of Review
and Compliance

STATE OF INDIANA



INDIANAPOLIS, 46204

DEPARTMENT OF NATURAL RESOURCES

JOSEPH D. CLOUD
DIRECTOR

May 8, 1975

Mr. Cletus J. Gillman
State Conservationist
United States Department of
Agriculture
Soil Conservation Service
Suite 2200
5610 Crawfordsville Road
Indianapolis, Indiana 46224

Dear Mr. Gillman:

This is in reply to your letter dated March 14, 1975, requesting comments on the draft copy of the Jordan Creek Watershed Work Plan and the draft copy of the Environmental Impact Statement.

My staff has reviewed both documents and do not have further comments at this time.

If we can be of further assistance, please advise.

Sincerely yours,

Joseph D. Cloud
Director
Department of Natural Resources

JDC/CCM:ca

Indiana State Clearinghouse
State Budget Agency
2 State House
Indianapolis, Indiana 46204

7503330480

Date Received

3-17-75

Review Terminated

AUTHORIZATION TO FILE APPLICATION

Mr. Cletus J. Gillman, State Conservationist

U. S. Department of Agriculture Soil Conservation Service

PROJECT: Watershed Plan & Draft Environmental Impact Statement for Jordon Creek
Watershed-Warren County

DOA

Federal Program Title; Agency and FDA Catalog No.

Amount of Funds Requested

The State Clearinghouse has reviewed the summary notification pertaining to the above project. With regard to the summary notification, the Clearinghouse makes the following disposition concerning this application:

☒ The proposed project is in accord with State plans, goals, and objectives at this time.

Refer to the attached comments.

You may now complete and file your formal application with the appropriate Federal Agency. This form, with comments if any, is to be attached to that application, and the lower portion of this form is to be completed by you, detached, and returned to the State Clearinghouse when the formal application is submitted.

Signature

State Clearinghouse Reviewer

May 30, 1975

Title

Date

Indiana State Clearinghouse
State Budget Agency
2 State House
Indianapolis, Indiana

St. Identification No. 75033

The formal application for Jordon Creek Watershed Plan & Draft Environ- was submitted to the
(Name of Project) mental Impact Statement

DOA

on

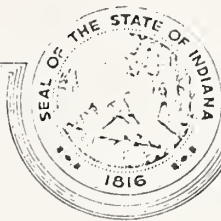
by

Federal Agency

Date

Name of Applicant

STATE OF INDIANA



INDIANAPOLIS, 46204

DEPARTMENT OF NATURAL RESOURCES

JOSEPH D. CLOUD
DIRECTOR

July 3, 1975

Mr. Cletus J. Gillman
State Conservationist
Soil Conservation Service
Atkinson Square West, Suite 2200
5610 Crawfordsville Road
Indianapolis, Indiana 46224

Dear Mr. Gillman:

I have reviewed the archaeological report for the Jordon Creek Watershed and concur with its findings and recommendations.

There are no sites of historic or architectural significance that will be effected by this project.

The mitigative steps of altering construction will conserve the existing sites and therefore meets with my approval.

Very truly yours,

Joseph D. Cloud,
Director
Department of Natural Resources

JDC.EG:jm

